Professional Scepticism:
Another audit expectation gap?

by

Kerri O'Donnell
BCom, CFE

Submitted in fulfilment of the
requirements for the Degree of
Doctor of Philosophy, Commerce

Tasmanian School of Business & Economics
University of Tasmania
2016

Statement of Originality

This thesis contains no material which has been accepted for a degree or diploma by the University or any other institution, except by way of background information and duly acknowledged in the thesis, and to the best of my knowledge and belief no material previously published or written by another person except where due acknowledgement is made in the text of the thesis, nor does the thesis contain any material that infringes copyright.

27/11/15

……. ……..

Kerri O'Donnell Date

Statement of Ethical Conduct

The research associated with this thesis abides by the international and Australian codes on human and animal experimentation, the guidelines by the Australian Government's Office of the Gene Technology Regulator and the rulings of the Safety, Ethics and Institutional Biosafety Committees of the University.

27/11/15

……. ……..

Kerri O'Donnell Date

Statement of Authority

This thesis may be made available for loan and limited copying and communication in accordance with the Copyright Act 1968.

27/11/15

……. ……..

Kerri O'Donnell Date

Acknowledgements

This thesis would not have happened but for the support and encouragement of a number of very important people.

I firstly take this opportunity to formally acknowledge and appreciate the very important role of the formal supervision team: Associate Professor Trevor Wilmshurst, Dr William Maguire, and Dr Sonia Shimeld; and to express particular gratitude to Dr Paul Shantapriyan for his exceptional mentorship. I also thank the examiners, and review committee members, for their considered and insightful feedback.

Very special thanks must also go to Professor Roger Willett; and graphic artist, Shannon Lee (www.ShannonLee.com.au).

I am also grateful to my professional and academic colleagues and other kind individuals, at University of Tasmania and across the world, for their interest, constructive attention, pearls of wisdom and feedback along the way – for listening, and asking the curly questions. These include, but are certainly not limited to: Dr Gail Ridley, Mr John Streeter, Mr Barry Hicks, the late Associate Professor Sue Hrasky, Mr Peter Collett, Mr John Pugh, Associate Professor Martin Grimmer, Associate Professor Mark Dibben, Dr Seu Keow Cheng, Professor Mardi Dungey, Professor David Adams (all of University of Tasmania), the organisers and mentors of the 2011 CSEAR Doctoral Colloquium (Hobart), Mr John Oliver (Solutions to Business P/L), Dr Judy Oliver (Swinburne University), Professor Ken Trotman (UNSW), Professor Rabinarayan Subudhi (KIIT University, India), Mr Heitor Moura Filho (Associação Biblioteca de Cultura, Brazil), Dr Antje Cockrill (University of Wales Trinity Saint David, Carmarthen), Dr Ulf-Dietrich Reips (Universität Konstanz, Germany), Mr Steve Taylor (Auckland University of Technology), Mr Daryl Connelly (Cradle Coast Innovation Inc), Mr Richard Chapman and Ms Gina Gunn (CPA Australia), Ms Caron Wilds, Mr Neil Christopher, Dr Anna Kamaralli (University of Notre Dame, University of Newcastle)… and the many others I encountered from around the world, who participated in my data gathering, promoted my survey to their wider networks, and expressed interest in, and encouragement of, my research. Numerous people took the time to sign up to a mailing list to learn the study outcomes, to connect with me via social and professional networks, and took the time to email that they wish me well. I am also grateful to officemate-extraordinaire, Mrs Debbie Wills, for her very important sense of work-life perspective. Thank you all.

I also wish to express enormous appreciation for my mother, Noelene Wilson. Like your Dad, you always try to make everyone happy: You have something that no education can teach, yet the world needs more and more of it.

For Shannon and Madeline Lee, who I value more than anything.

Extended Abstract

Auditor independence became a focus of regulatory and accounting research due to a number of large corporate collapses involving fraud in the early 2000s. The focus of research was the reduction of auditor bias, and attention to improving the auditors' objective position as a means to enhance the identification of fraud and mitigate the risks of issuing an inappropriate audit opinion or being implicated in fraud cases.

Audit team members are required, under the International Auditing Standards, to exercise professional scepticism throughout the audit process. In Australia, this requirement is mandatory under the *Legislative Instruments Act 2003*, and auditors have been held accountable in the courts for failure to exercise an appropriate degree of professional scepticism following audit failure.

Two aspects under International Auditing Standard ASA200 (AUASB, 2013b) are associated with professional scepticism: A questioning attitude, and critical assessment of evidence. Interestingly, a professional level of that attitude is not defined within the Standard, so it is not clear how auditors can judge whether they are exercising an appropriate standard of scepticism.

This research explored whether a 'professional' standard, or level, of scepticism could be identified, and developed the notion of level to distinguish a range of 'professional scepticism' from ranges of lay scepticism and less objective attitudes. The levels are then used to explore whether external auditors exercise the appropriate professional scepticism, as mandated by the International Auditing Standards. This extends prior research, which has attempted to measure auditor scepticism focused on the attitude factor only, and resulted in relative measures of scepticism that compared auditors with other auditors rather than comparing with a 'professional' level or benchmark.

In this research, a conceptual model of professional scepticism is developed, illustrating the interrelationships between the attitude and critical assessment aspects. The literature informing the model supports the view that the attitude factor reflects an inherent trait, while critical assessment is a learned skill, developed over time, and

influenced by training and/or experience. Together, these factors represent a *default* level of scepticism, being a default mindframe in the absence of prompts to increase vigilance, and distinct from a state that may be achievable by such an increase in vigilance.

Three established questionnaires were combined to address the trait and skill aspects of the model: Wrightsman's (1991) Interpersonal Trust Scale, Budner's (1962) Intolerance of Ambiguity Scale, and The Curiosity and Exploration Inventory-II (Kashdan et al, 2009). These generic inventories were chosen to facilitate participation by non-auditors, enabling exploration of a broad range of sceptical and non-sceptical attitudes and skills, increasing the range of observations across the model continuum for the purpose of establishing scepticism levels.

The resulting questionnaire was administered online to potential participants via social media. This method of recruitment enabled participation by subjects across the world, appropriate to the modern international educational, commercial and investment scenarios. Clusters of relevant participant groups were encouraged by advertising the survey to the memberships of qualified fraud examiner and auditor groups' online discussion boards, and the social media construct was utilised to snowball recruitment to a reasonably diverse cross-section of adult internet users without accounting, auditing or fraud training. The non-specialist participants could be expected to have a direct or indirect interest in the truth and fairness of financial statements, as business decision makers, employees, investors and/or consumers. Participation was voluntary, anonymous and without reward.

Of 298 completed surveys, 7 participants were excluded, resulting in 291 usable responses. After preliminary analysis, the survey instrument was analysed and reduced to a 17-question instrument with a Cronbach's Alpha of 0.910 and two confirmed factors.

Each participant's data was scored in two ways: Firstly, a Bias Score indicated a degree of personal bias as well as the direction of bias, toward either trust or distrust, where a score of zero represents the lowest level of subjective or dispositional bias and the maximum bias score is +/-26. This score was derived solely from the items in Wrightsman's (1991) Interpersonal Trust Scale. Secondly, each participant's data

was received a Scepticism Score, derived from all items in the composite scale, converted to a percentage, where 100% represents the highest level of professional scepticism. The objective of the dual-scoring process is to offer clarity in instances that an auditor's Scepticism Score is lower than the professional level benchmark: The directional Bias Score may be useful for deciding upon relevant skill development activities for those whose scores suggest a high level of trust in others (at the positive sign end) which could result in increased audit risk or, conversely, a high level of distrust (at the negative sign end) which could result in audit inefficiencies.

Two standard deviations of the mean of scores of qualified fraud examiners (n=41), whose work is centred on use of admissible, relevant and reliable evidence for prosecution of fraud cases, were utilised to establish a boundary to the 'professional' range of scepticism, by virtue of the role of evidence in their work. This top level of scepticism was expected to capture 95% of those participants whose work entailed objective evidence-based judgments. Two further ranges were established: A middle range, between the professional benchmark and the mid-score of 50%, expected to capture those participants whose judgements are more likely informed by evidence than subjectivity; and the lower range, below 50%, expected to capture those participants whose judgements are more likely informed by subjectivity than evidence.

An unexpected Sophisticated Layperson (SL) group emerged from the exploration: Qualified accountants without external audit experience or fraud training (n=52), employed in corporate roles. This group's mean Bias score was substantially less trusting than all other participant groups', and the range of scores within the group was quite narrow. In contrast, the scores of the Non-sophisticated Layperson (NSL) group (n=153) spread very much further along the scepticism continuum in both trust and distrust directions, as anticipated.

Testing revealed that 51% of external auditors (n=45) in the study returned default scepticism scores within the 'professional' range, with the average mean score attributing to the auditors slightly less trusting attitudes than fraud examiners. Auditors scored .0947747 points, 95% CI [.140962, .048587], above the professional benchmark, set at two standard deviations of the mean of Qualified Fraud

Examiners' scores. This difference is statistically significant, $t(44) = 4.135$, $p < .001$, and statistically moderate at $d = 0.6165$. Further, Auditor participants were, on average, less biased than all other participants, and the mean Auditor score diverges only 3% (1/26) from the optimal objectivity point.

Overall, the results of this research suggest that a small majority of external auditor participants in the study do exhibit a professional level of *default* scepticism. Other observations arising from the data suggest that future research may be warranted to explore whether accounting training is more effective than fraud training for the purpose of mitigating trust bias and increasing the efficacy of evidence-based judgments, and to understand whether the high scores achieved by trained Accountants working in corporate roles are attributable to taking a preparer perspective, rather than a user perspective, when evaluating information.

List of Abbreviations

Abbreviation	Full Description
ACFE	Association of Certified Fraud Examiners
AUASB	Auditing and Assurance Standards Board
CPAA	Certified Practicing Accountants Australia
IAS	International Auditing Standard
ICAA	Institute of Chartered Accountants Australia
NSL	Non-sophisticated Layperson
QFI	Qualified Fraud Investigator
SL	Sophisticated Layperson

List of Figures

List of Tables

CONTENTS

Chapter 1: Research Context

1.1 Introduction

Lack of professional scepticism is a cause to which audit failure has been directly attributed (ACRA, 2013; ASIC, 2010; CPAB, 2013; PCAOB, 2012a, 2013; Glover & Prawitt, 2014), particularly when such failures involve material misstatements due to fraud (Trompeter et al, 2013). According to Beasley, Carcello and Hermanson (2001), lack of professional scepticism is one of the most common audit deficiencies, along with lack of due care and failure to collate sufficient evidence of sufficient quality. Bonner (1999) has suggested that little or no professional scepticism is utilised to inform judgements, increasing the probability that audit judgments will be based on incomplete or inaccurate information. Indeed, in 80% of the SEC enforcement action cases studied by Beasley et al (2001), auditors "failed to gather sufficient evidence", while in 40% of cases, they over-relied on management explanations and did not "challenge explanations that were inconsistent or refuted by other evidence the auditor had already gathered".

The IAASB (Gunn & Jules, 2012, p1) reinforce that:

> *"[t]he need for professional skepticism in an audit cannot be overemphasized… In the aftermath of the 2008–2009 global financial crisis, recent audit inspection reports in various jurisdictions have noted areas … where regulators and oversight bodies believe that auditors should have more clearly demonstrated professional skepticism."*

The IAASB has also more recently issued an Invitation to Comment (IAASB, 2016) on its current work, titled 'Enhancing Audit Quality in the Public Interest: A focus on professional scepticism, quality control and group audits'. O'Malley (2016) noted that the International Forum of Independent Audit Regulators (IFIAR) is concerned that the audit profession has still not done enough to improve audit quality, with

deficiencies being found in 43 per cent of audit inspections. Professional scepticism is essential to audit quality, underpinning the premise of independent assurance, however the industry recognises that more work is necessary in this area in particular (Chartered Accountants, Australia & New Zealand, 2014). Indeed, in the Australian Securities & Investments Commission's Audit Inspection Program Report for 2014-15, 'audit evidence and professional scepticism' featured as the first of the key findings communicated (ASIC, 2015), noting that the level of professional scepticism must continue to improve.

Professional scepticism is an important part of professional judgment, which all members of audit teams (AUASB, 2013b, para. 13(d)) are required to exhibit throughout the audit engagement (AUASB, 2013b). The Auditing Standards (AUASB, 2013b, para. 13.4(l)) define professional scepticism as:

> *...an attitude that includes a questioning mind, being alert to conditions which may indicate possible misstatement due to error or fraud, and a critical assessment of evidence.*

Professional scepticism can be considered of particular significance in cases of fraud because fraud involves deception and disguise (Grenier, 2014), making it far more difficult to identify than error.

Professional scepticism is mandated by the International Auditing Standards, and in Australia, the "Auditing Standards are legislative instruments under the *Legislative Instruments Act 2003*" (AUASB, 2013b, p.4; Wong, 2008, p.46). This means that the Standards are legally enforceable. The Standards apply to *all* members of audit engagement teams (AUASB, 2013b, para. 13(d)).

Prior to the legislative change, auditors could be liable to others for losses suffered as a result of auditor negligence: Clients could sue for breach of contract pursuant to the agreement embodied in audit engagement letters; and other parties could sue for damages under the tort of negligence, provided that they could show a duty of care was owed by the auditor. Court rulings about such claims, over more than a century, have informed the development of our modern perspectives about foreseeability, reasonable care and skill, and independence, as precursors to our understanding of professional scepticism. If found guilty, auditors were liable to compensate claimants for relevant financial losses suffered as a result of their negligence. Common law rulings were so influential that their role is discussed in more detail for the purpose of defining professional scepticism in Section 2.2 of this thesis.

Auditors could also be sanctioned by their professional bodies for breach of the Australian Professional and Ethical Standards Board Code of Ethics (APESB, 2013), which is also enforceable pursuant to Auditing Standard ASA102 Compliance with Ethical Requirements when Performing Audits, Reviews and Other Assurance Engagements (APESB, 2013, para 1.4). The Code's Professional Behaviour principle, which obliges all members of professional bodies to "comply with relevant laws and regulations and avoid any action or omission that the Member knows or should know may discredit the profession" (para 150.1). The fundamental principles of the Code also include the requirement to maintain professional competence and comply with relevant Standards (APESB, 2013, para 100.5(c). These sanctions can include reprimands, fines, suspension and/or expulsion from the professional body (CPAA, 2016).[1]

[1] Examples of recent decisions, and penalties applied by the CPA Australia Disciplinary Tribunal are published at https://www.cpaaustralia.com.au/about-us/member-conduct-and-discipline/outcome-of-disciplinary-hearings, last accessed 26/7/16.

In addition, the Companies Auditors and Liquidators Disciplinary Board (CALDB) acts as an independent tribunal that assesses complaints made against auditors under the *Corporations Act 2001* (s 1292) (CALDB, 2016a). Penalties that can be applied include suspension or cancellation of auditor registration (Corporations Act 2001, s 1292(1).[2]

Following the change to legal enforceability, the range of potential consequences is expanded. In addition to the consequences above, auditors may now face prosecution for breach of statute, independently of any contract or tort action, because these actions are not mutually exclusive. If held accountable under statute, auditors may now incur fine and/or jail penalties. It has been argued, however, that making auditing standards legally enforceable may be counterproductive to global harmonisation (Allen, 2006), and that fines would not improve auditor performance (Brown, 2003).

Even before legal enforceability, auditors have been held accountable in court for failure to exercise sufficient *professional scepticism* (Harding & Trotman, 2015). However, the determination of what constitutes sufficient professional scepticism has been a matter for courts. Scepticism is an "attitude" (AUASB, 2013b, para. 13(l)), and a professional level, or benchmark, of that attitude is not defined by the Standards, so it is not clear how auditors are to evaluate whether they are exercising an appropriate level of scepticism prior to such an evaluation being made in a court of law.

Combined, legal accountability and the linkage between fraud and audit failure suggest that professional scepticism is a key factor in the identification (or not) of

[2] Examples of recent decisions, and penalties applied by the Companies Auditors and Liquidators Disciplinary Board are published at http://www.caldb.gov.au/decisions/caldb-decisions/, last accessed 26/7/16.

fraud in financial statements. Accordingly, prior research identifies that auditors who exhibit more professional scepticism are more likely to identify contradictions in evidence and generate alternate hypotheses for observations (Hurtt et al, 2013) and pay greater attention to unethical behaviour (Rose, 2007) and fraud cues (Popova, 2013).

Of concern for this research are the global statistics which indicate that external auditors are only responsible for less than 5% of financial statement fraud detections (ACFE, 2014b, p.19). This study explores professional scepticism in an effort to understand more about why cases of material financial statement fraud elude the external audit process (Dyck et al. 2010 in Grenier, 2014).

The remainder of this chapter introduces problems that fraud presents, in general, and to external audit in particular. The research problem is then narrowed to identify the research gap and the specific research questions. The objectives of this study are then defined, followed by description of the approach taken to conduct the research.

1.2 Background

This study of auditor scepticism was initially prompted by the problem of fraud, its various potential impacts on financial reporting, and the challenges that fraud presents to auditors when deceptively hidden in financial records. Academic literature has explored these challenges, and revealed that auditors who are very trusting are less sceptical than others, and therefore less likely to focus upon evidence that reveals fraud (Harding et al, 2016, p.5).

The Australian Auditing and Assurance Standards Board (AUASB, 2013a, para. 11(a)), adopts the international auditing definition of fraud as:

> *...an intentional act by one or more individuals among management, those charged with governance, employees, or third parties, involving the use of deception to obtain an unjust or illegal advantage.*

Fraud is a particular subset of the crime definition, known as *white-collar crime*, set apart from theft by virtue of its concealment within business in an increasingly industrialised world. First coined in the 1940s by EH Sutherland (Latimer, 2000), the term white-collar crime was further contextualised in 1977 by criminologist H Edelhertz (in Latimer, 2000, p. 97) to encompass:

1. *Crimes by persons operating on an individual, ad hoc basis, for personal gain in a non-business context.*
2. *Crimes in the course of their occupations by those operating inside business, government, or other establishments, or in a professional capacity, in breach of their duty of loyalty and fidelity to employer or client.*
3. *Crimes incidental to and in furtherance of operations, but not the central purpose of such business operations.*
4. *White-collar crime as a business, or as the central activity of the business.*

This research is concerned with aspects 2) and 3) due to the potential of these misstatements to impact upon the financial statements of a business.

Fraud is commonly associated with large, isolated incidents, but this is not the case (AUASB, 2013a, para 35; Wells, 2003), with many perpetrations occuring in smaller entities (COSO, 1998; Naydorf, 2004). This misconception is reinforced by media coverage of high profile corporate collapses (Glover et al, 2005; Fisher, 2007), which represent fraud as a special issue rather than an everyday possibility.

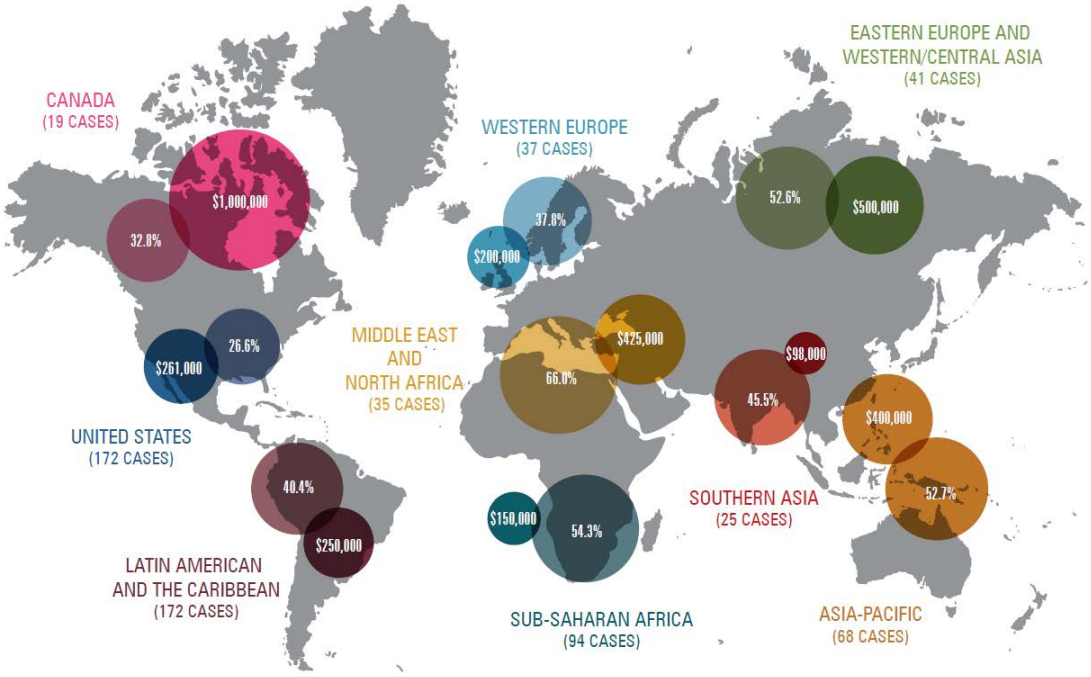
Fraud has been recognised as “a global epidemic” (Butler, 1986, p.36), and a “huge problem in Australia” (Abernethy, 2005, p.30); and the problem is growing (KPMG,

2013). Fraud is “a pervasive problem that knows no boundaries, regardless of the industry, the country, or the size of the company” (Peterson and Zikmund, 2004, p.30). It is a problem that can occur in every environment, involve an exchange of benefit, and can result in substantial financial losses (Association of British Insurers, 2015).

Figure 1.1, below, illustrates the distribution and median losses of 1,483 cases investigated by Association of Certified Fraud Examiners (ACFE) members across the world (ACFE, 2014b, p. 13).

Whilst that data is far from exhaustive, Transparency International (2014), further reports that “not one” of the 175 countries studied for its 2014 Corruption Perceptions Index, was free of corruption, which is just one type of fraud that can ultimately impact upon financial statements (ACFE, 2014a). Appendix 1 depicts further types of fraud; all of which can result in materially misstated financial reporting.

Figure 1.1 Global Distribution and Median Losses of 2013 Fraud Investigations



SOURCE: ACFE, 2014b, p. 14

The depth of the problem can be seen with an average of 5% of revenues lost to fraud each year (ACFE, 2014b). "Applying the percentage to the 2013 estimated Gross World Product of $73.87 trillion results in a projected potential total global fraud loss of nearly $3.7 trillion" for that year (ACFE, 2014b, p.8). In Australia, the KPMG Fraud Survey (2013, p.6, 17) reported fraud losses of $373 million in 2012, with 43% of victim organisations reporting average losses of more than $3 million. Whilst these KPMG figures represent less than 5% of Australian GDP, KPMG (2013) reports increases in incidence (ACFE, 2009b; Goldmann, 2009; Zipkin, 2009); increases in collusion, which typically involves higher dollar value losses; and increase in higher dollar value frauds generally (Association of British Insurers, 2015), when compared with prior Surveys conducted over the previous 15 years (KPMG, 2013, pp. 6-7).

New and more sophisticated (Nigrini & Meuller, 2014; ACFE, 2009a; Abernethy, 2005) methods of fraud perpetration are enabled by an increasingly technological and global commercial environment (Carmichael, 1975; O'Leary & Cotter, 2000; Abernethy, 2005). Technology is growing at such a rapid pace that perpetrators are able to discover outstanding security loopholes (Hargreaves, 2013). Zipkin (2009) reports that perpetrators are finding new ways to commit fraud, and "… corporate violations are increasingly difficult to discover, investigate, or prosecute successfully because of their growing complexity and intricacy" (ACFE, 2009a, p.4.403), to the extent that they can elude discovery by even a well conducted audit (Trotman, 2006). This is enabled by increasingly complex legitimate accounting transactions (Glover & Prawitt, 2014), fair value accounting methods (Trotman, 2006), high volume computerised information systems, and online commerce which mean that perpetrators no longer have to be physically present to make fraudulent transactions (Nigrini & Meuller, 2014).

"As the audit environment becomes more demanding and complex, so does the set of analytical tools available to an auditor" (Knechel et al, 2010). However, whilst these tools assist auditors to sort and identify samples, and to highlight potential anomalies, they cannot replace the inherent audit need for scepticism in evaluating such anomalies.

1.3 Motivation

Audit clients are responsible for devising and implementing controls to prevent and detect fraud, and for monitoring and maintaining the effectiveness of those controls (AUASB, 2013a, para 4). The external financial statement audit function formally provides a "reasonable" level of assurance (AUASB, 2013b, para. 5). Although this a high level of assurance, it is not a *guarantee* that the financial statements are

completely free of error and/or fraud (AUASB, 2013b, para 5), but rather an opinion that they are "prepared, in all material respects, in accordance with the applicable financial reporting framework" (AUASB, 2011, para. 7(c)). Despite the onus on clients, audit failures have led to increased responsibility on auditors to detect fraud in client's financial statements (DeFond & Zhang, 2014; Trotman, 2006), and failure to do so invariably leads to criticism of audit firms and the audit profession in general (Harding & Trotman, 2015; Grenier, 2014; Westermann et al, 2014).

The risk of issuing an inappropriate audit opinion also exposes auditors to litigation (Grenier et al, 2015) and potential liabilities arising as statutory charges for breach of duty imposed by the *Corporations Act 2001*, breach of contract with the audit client, and common law claims lodged by users of audited financial statements who have suffered losses as a result of material misstatement. The penalties range (Peecher et al, 2013b) from disciplinary actions taken by professional bodies to jail sentences decided in courts of law, and auditors are "only implicitly and problematically protected" from litigation by an audit judgment rule (Peecher et al, 2013b, p.605) when judgments are made in good faith and on a reasonable basis (Brown et al, 2014). Peecher et al (2013b) argue that, in future, auditor scepticism will be enhanced if the penalty-based approach to regulation reinforcement were replaced by a consequence model that accommodated accountabilities for judgment processes as well as outcomes, and that included rewards for fraud identification.

Nonetheless, it is generally accepted that the majority of frauds remain undetected (REAGAN Accounting & Consulting Group, nd; ALMR, 2014). Ninety seven percent of detected fraud schemes are brought to light by parties other than external auditors (ACFE, 2014a; ACFE, 2014b; KPMG, 2015; Grenier 2014), such as employees, vendors, customers and anonymous whistle blowers (ACFE, 2014b). However, such reports generally relate to employee fraudsters, and the risk of fraud

perpetration by executives requires a different approach, because executives pose a "significant" risk (ACFE, 2007b, s.1-229).

The most costly financial statement frauds are committed by executives (ACFE, 2014b, p.41; KPMG, 2004), who are in the best position to override controls over financial reporting (ACFE, 2014b, p.53). In such instances, the auditor is unlikely to identify control breaches because the perpetrator has already ensured that controls relevant to his/her particular fraud are absent or ineffective, and they perceive they will get away with it: That is, *they can* (Nigrini & Mueller, 2014). The Auditing Standards (AUASB, 2013a, paras. 5-7) advise that:

> *…the risk of not detecting a material misstatement resulting from fraud is higher than the risk of not detecting one resulting from error… [and] the risk of the auditor not detecting a material misstatement resulting from management fraud is greater than for employee fraud.*

Executives with strong accounting expertise are favoured by boards, but fraudsters in these positions, with these skills, are well placed and equipped to "manipulate accounting records, present fraudulent financial information, or override control procedures designed to prevent similar frauds by other employees" (ACFE, 2007b, s.1-223; AUASB, 2013a; Wells, 2003), and which are effective in ordinary circumstances (ACFE, 2007b, s.1-229). "Among all financial personnel, the CFO is in the best position to know how to cook the books and keep it from being uncovered" (ACFE, 2007b, s.1-341; Wells 2003; Erickson et al, 2000). Whilst less frequent (ACFE, 2014b, p. 40), the dollar value of executive frauds is typically very much higher than employee-perpetrated frauds (ACFE, 2014b, p. 41; KPMG, 2004) and it takes longer to detect (ACFE, 2014b, p.41).

Demand for fraud expertise is greater than ever (Logan, 2009; Zipkin, 2009; ACFE, 2005a; Simpson, 2004), including need for auditors to develop sound fraud-detection

audit techniques (Trompeter et al, 2013; Dorminey et al, 2012; ACFE, 2007a; Beasley et al, 2001).

Fraud is very difficult to detect because it is concealed within the organisation's ordinary accounts (AUASB, 2013b; AUASB, 2013a). That is, the perpetrator *intends* to obtain an unfair advantage, and, if necessary, deliberately *conceals* his/her activities to reduce risk of detection. This presents challenges which complicate the audit process, far beyond the challenges of identifying errors. Fraud is distinguished from errors or mistakes in judgement by the fundamental characteristics of intention (ACFE, 2009a, s.1-303, s.2-201; AUASB, 2013a, para. 2) and deception (ACFE, 2009a, s.1-303, s.2-201; AUASB, 2013a, para 6).

Detection is complicated because fraud may also involve *omissions* of material amounts or disclosures (ACFE, 2009a, s.1-303; AUASB, 2013a para A28). This means that discovering fraudulent misstatement may entail observations about information which is not there.

A further problem is the evolving *nature* of fraud and the need for flexibility in regulatory approaches that encompass new perpetration methods as they arise. The conundrum is that whilst the auditing regulation must therefore remain largely a matter of substance over form, the *spirit* of regulation is subject to interpretation, judgement and potential loopholes.

1.4 The Research Problem

Whilst external auditors do not play a large role in identification of fraud generally, they do play a relatively greater role in identifying frauds that extend over multiple reporting periods and involve high dollar values (ACFE, 2014b, p. 20). Therefore,

external auditors are in a position of particular importance concerning executive fraud, as well as an important role in seeking to address fraudulent financial misstatement in general (Harding & Trotman, 2015; AUASB, 2013a; PCAOB, 2007).

Auditors must consider fraud risks appearing as control weaknesses (AUASB, 2013c), be alert to the possibility of fraud (AUASB, 2013a), and identify red flags of fraud (AUASB, 2013a), being characteristics, techniques and types of fraud applicable to the client environment. This suggests that at least three explicit stages of evaluation are required to fulfil this responsibility to detect fraud:

1) Assess risk by forming an understanding of the client entity (AUASB, 2013c);
2) Assess the adequacy of internal controls to prevent and detect fraud (AUASB, 2013c); and
3) Assess whether red flags are present in financial statements.

Auditors can demonstrate due care and diligence in the making of such assessments by providing evidence that the audit was conducted in accordance with the Auditing Standards, though it has long been recognised that auditors must apply the substance of regulatory guidance to the facts of their particular audit client case by utilising professional judgement and professional scepticism (Bonner, 1999; Nelson 2009; Hurtt et al. 2013). It is arguably the processes involved in *applying* the Standards and other guidance that exposes auditors to professional discipline and litigation risks.

As the auditing standards define the term ‘auditor’ to include all members of audit teams (AUASB, 2013b), this implies that expectations extend to all members of audit teams, from the engagement partner to the most junior undergraduate assistant

accountant. The International Auditing Standards require that *all* auditors exercise professional scepticism (AUASB, 2013b), indicating an expectation that all auditors are *capable* of scepticism.

This expectation may be inappropriate, at least to an extent. Given that the Standards do not clarify how to apply scepticism for the purpose of forming the necessary judgements, there may be vast inconsistencies between auditors in the ways they approach sceptical thinking, or sceptical interpretation of information. There is also no currently available means of measuring professional scepticism for the purpose of identifying whether all audit team members exhibit scepticism, or assessing whether that scepticism is appropriately professional. Without means of measuring the status quo, we have no means of measuring performance against the expectations in the Auditing Standards to identify any need for improvement. The purpose of this research is to address that measurement gap.

1.5 Research Objectives

The scope and direction of this research pivots on the assumption, embedded within the Auditing Standards, that all members of audit teams are *capable* of a professional level of scepticism. The issue of whether auditors do in fact exercise a professional level of scepticism, as mandated by the Auditing Standards, has not been resolved by prior, discipline-specific, research.

This study seeks to develop understanding of 'professional' scepticism, and explores the notion of *levels* of scepticism for the purpose of distinguishing a range of 'professional' scepticism. A scale measure of scepticism is developed, and the results compared with the professional level boundary to explore whether auditors exercise 'professional' scepticism, as mandated by the Auditing Standards.

To achieve the objective of devising an appropriate scale, a conceptual model is developed to demonstrate interrelated concepts in the literature. The model draws upon literature which aligns with the definition of professional scepticism in the Auditing Standards, with the view that "an attitude that includes a questioning mind" (AUASB, 2013b) constitutes an inherent *trait*, while "critical assessment" (AUASB, 2013b) is a learned *skill*.

1.5.1 Research Questions

Given that auditors have been criticised for exercising insufficient scepticism during the audit process (Beasley et al, 2001), in attempting to contribute to understanding of the main problem, this research will explore the following specific questions:

RQ 1: Do auditors and other groups exhibit different levels of scepticism?
and
RQ 2: Do auditors exhibit professional scepticism?

1.5.2 Importance

This research extends published academic discourse by introducing the skill aspect of professional scepticism into measurement. Prior research has attempted to measure only the trait aspect, which is acknowledged as only part of professional scepticism (Hurtt, 2009).

Further, prior measures have resulted in relative measures of scepticism, comparing auditors with other auditors, rather than establishing a discrete measure or benchmark of professional scepticism. Relative measures are problematic for the purpose of distinguishing levels. The combination of a dual-factor approach (encompassing both Trait and Skill) and discrete measurement (professional

scepticism benchmark) is intended to enable assessment of auditors' default scepticism; that is, the basic mindframe experienced in the absence of workplace-specific risks or cues to initiate a heightened state of scepticism.

Such a measure may be useful for the purpose of comparing performance with the requirements of the Auditing Standards, and may provide guidance as to the nature of professional developments to improve scepticism via a proactive approach. That is, prior to audit failure and examination in the courts.

The dual-factor approach is also an important step in progressing understanding of what scepticism is, and how it might manifest in the audit environment. Prior research has established that professional scepticism entails more than the Trait foundation (Hurtt, 2009), so it is necessary for this contribution to encompass the existence of another construct. For the purposes of this research, that construct is defined as Skill. This term is inspired by reference to the task of 'critical assessment' in the Auditing Standard definition of *professional scepticism*. Although many terms have been used by academic authors to describe this other factor[3], it is generally accepted that it is distinct from, and offers support to, Trait scepticism, and is related to assessment of evidence (Grenier, 2014; Harding & Trotman, 2015). Previous studies which specifically refer to Skill include Anderson (2009) and Nelson & Tan (2005).

For the purpose of guiding the nature of professional development activities, the research also offers an additional indicator. This may simplify identification of types of training which are most appropriate for auditors with a sceptical position which would be considered below the 'professional' benchmark, by identifying whether the deficiency is related to audit risk or to audit inefficiency. This may lead to improved

[3] For example, self-criticism (Grenier, 2014), state scepticism (Hurtt, 2009), or inward scepticism (Harding & Trotman, 2015; Grenier, 2014).

training outcomes for auditors, lower audit risk for audit firms, and mitigation of liability.

Findings may also be of significant interest to professional bodies, in terms of continuing professional development and evaluation of accredited education components, and to independent regulators relying on the assumption that all auditors are sceptical at the *professional* level. It is important to identify a benchmark to differentiate the professional level of scepticism, if identification is possible, because the profession and the regulatory bodies may need to consider fresh remedial measures if there is found to be an expectation gap between the requirements explicit in the auditing standards and auditors' capacity to comply.

There already exists a well-known Audit Expectation Gap which refers to asymmetry between preparers and users of audit reports, whereby users' perceptions of audit work far exceed the scope of audit engagements. Koh and Woo (1998, p.147) blame this asymmetry for what they term as a "legal liability crisis facing the accounting profession". Indeed, this gap is linked to many courts' determinations regarding reasonable care, foreseeability and proximity, forging the balance between the auditor's role of watchdog, versus claimants' perception of a bloodhound which ought to identify all error and fraud (*Kingston Cotton Mill 1896*). However, continuing calls for accountability indicate that the balance and symmetry are not yet achieved, and De Martinis and Burrowes (1996) argue that more recent court actions against auditors have even widened the gap. Koh and Woo (1998) agree, noting that the public requires someone to be held accountable for corporate failures, and judges continue to expect more from auditors.

De Martinis and Burrowes (1996, p.17) use the terminology "performance gap" to describe the audit scope problem described above. The *regulatory* expectation gap to

which this research refers, is similar in that it potentially involves information inconsistency, but the players are different: In this instance, the potential misalignment is between auditors and the regulatory authorities. An extreme example of the effects of this gap is that if auditors are constrained by some variable such that some or all are inherently unable to perform at the required professional level of scepticism, then they are inherently prone to breach of the legally enforceable auditing standards. We do not currently have an identified benchmark; nor a reiterative method of reliably measuring auditors' scepticism to compare with it, and therein lies a substantial information gap given that auditors are obliged to maintain a standard they can not objectively or reliably identify.

Research outcomes which inform a framework to improve understanding of auditors' professional scepticism and its efficacy are fundamentally important for the purpose of understanding whether auditors are capable of fulfilling their legal obligations, and, if not, how that gap might be contracted. This research is expected to reinvigorate academic discourse in the scepticism component of professional judgement.

1.6 Scope of the research

The remainder of this thesis is structured as follows: Chapter 2 contains a review of existing literature from the profession and contributing disciplines to explore professional scepticism in more detail. Chapter 3 compiles a research model, from which hypotheses are extracted. The research method is set out in Chapter 4, followed by reporting of results in Chapter 5. In Chapter 6, the results are discussed, and Chapter 7 presents conclusions, and also sets out limitations of this particular study along with implications for accounting education and future research.

Chapter 2: Professional Scepticism

2.1 Introduction

Professional scepticism underpins the entire audit process (AUASB, 2013b; PCAOB, 2012a), yet is the least understood (Glover & Prawitt, 2014) component of professional judgement, despite a significant volume of research activity on the topics of auditor judgement and professional scepticism during the past two decades (Nelson and Tan, 2005; Humphrey, 2008). A substantial part of that problem is that scepticism is very difficult to measure (Hurtt et al, 2013; Grenier, 2014), and to date myriad methods of measurement are still being explored. The conundrum is that a divergence of conceptualisations about what constitutes professional scepticism exist (Grenier, 2014; Nolder & Kadous, 2014), impeding understanding (Glover & Prawitt, 2014) and the progress of measurement tool development. Therefore the regulatory, professional and academic attempts to improve professional scepticism would benefit from establishing a more universal consensus of underlying factors and variables (Nolder & Kadous, 2014).

While professional scepticism is an essential part of forming audit judgments (AUASB, 2013a; Westermann et al, 2014; Glover & Prawitt, 2014; Quadackers et al, 2014; Nolder & Kadous, 2014; Trotman, 2006), it is maintained that lack of professional scepticism is a common audit deficiency (PCAOB, 2012a; Nelson, 2009; Westermann et al, 2014) associated with inadequate due care and a failure to collate sufficient evidence of sufficient quality (Beasley et al, 2001). Indeed, it has been asserted that auditors generally fail to recognise material misstatement (Wells, 2005; Hall, 1996); and use little or no professional scepticism to inform their judgments (Bonner, 1999; ASIC, 2010; Grenier, 2014).

The major audit judgement error identified by the AUASB is Audit Risk; being the "...risk that the auditor expresses an inappropriate audit opinion when the financial report is materially misstated" (AUASB, 2013b, para. 5). This means that a material misstatement exists in the financial statements and is not detected. Audit risk also applies to modified audit opinions if the modification does not encompass the material misstatement. The Auditing Standards acknowledge Audit Risk from only the false-negative perspective and not the false-positive. This is ostensibly because the consequences of a false negative involve greater potential losses and liabilities when weighted against the false-positive consequences of wasted, and perhaps unbillable, time.

The audit risk model (Changa et al, 2008) assumes a positive relationship between perceived audit risk and scepticism rigour; however it is not yet known whether an increase in perceived risk of material misstatement does, in practice, lead to an increase in scepticism, or simply an increase in substantive testing, which may give the appearance of increased scepticism (Beasley et al, 2001). Prior studies[4] have resulted in inconsistent findings as to the usefulness of the Audit Risk Model in practice, in terms of whether the multiplicative association between inherent risk and control risk is appropriate, and in terms of whether auditors utilise the theoretical relationship at all (Nelson and Tan, 2005). From an ex-post descriptive perspective, Nelson and Tan (2005) propose that the model could be of little value in situations where fraud exists, on the basis of a prior study (Houston et al, 1999; Nelson & Tan, 2005) in which the model was found to describe audit planning decisions in the event of material errors, but not fraud (Nelson and Tan, 2005).

[4] For examples see Asare & Wright (2004), Payne and Ramsay (2005), Nelson & Tan (2005), Hoffman & Zimbleman (2009).

Efficiency is an important factor in audit practice (Glover & Prawitt, 2014), as indicated by the standard practice of sampling (AUASB, 2009). That is, of those sample components reviewed, whether the exceptions identified are tolerable given the tests of materiality and audit risk. This means that the focus is on *management by exception*. Important difficulties associated with that perspective are in identifying exceptions, and whether the identified exceptions are most likely due to error or fraud. A significantly complicating factor, however, is that fraud does not necessarily present as exceptions.

In this chapter, professional scepticism is defined and explored to increase understanding for the purpose of measurement. The contributing factors, limitations, and means of achieving professional scepticism, are then explored, and a regulation-specific conceptualisation of professional scepticism is offered. Finally, a model of the contributing factors is presented.

2.2 Professional Scepticism Defined

Definition of professional scepticism has developed over more than a century, embedded in courtroom discussion of the concepts contributing to reasonable care and skill, judgment about which has distinguished whether auditors were, or were not, held liable when clients' accounts were materially misstated. This process did not produce early definitions about auditor judgment, or aspects of judgment such as scepticism per se. Rather, such discussions were framed in terms such as 'reasonable care' and 'reasonable skill', as noted by the judges in landmark cases, such as *London and General Bank Ltd* (1895) and *Kingston Cotton Mills Co (1896)*, which are still commonly referred to today, to introduce current auditing students to such concepts.

However, the difficulty in gleaning generalizable guidance from these judgments is that the constitution of those terms "must depend upon the circumstances of each case" (Lord Justice Lopes in *Kingston Cotton Mills Co*. Nonetheless, Lord Justice Lopes did introduce an objection to auditor use of *assumption*, which is central to auditor scepticism as we know it today. Specifically, the *Kingston Cotton Mills Co* case made a key contribution by ruling that an auditor is not required to approach work "with suspicion, or with a foregone conclusion that there is something wrong" (Ch. 279). That contribution is incomplete, however, because the judgment went on to partially sanction the opposite form of assumption by stating at paragraph that an auditor is "entitled to assume that [clients] are honest and rely upon their representations, provided he takes reasonable care". Such an entitlement is problematic if financial statements are fraudulently misstated, and given that 'reasonable care and skill' were matters for the courts to determine, ex-post, the judgments of many more auditors have been examined by the courts since the late 1800s.

In 1948, industry professional F. E. Trigg presented a report to the Australian Congress on Accounting, stating that "the general principles of professional auditing practice were not generally understood in Australia; and even where they were understood, they were not, as a rule, applied in practice" (Gibson & Arnold, 1981). Trigg further explained (Gibson & Arnold, 1981) that:

> *The approach to professional auditing in the forties was, in a large measure, unintelligent. Books were checked and ticked in a stereotyped fashion—the "tick and turn-over method" it was called. This method of course achieved little. Very few audits were planned as to their scope and character—that is to say, based on the auditor's knowledge of a company's business, how the business was organized, the state of accounting and so on, and still less on the auditor's evaluation of the company's system of internal control. In short the entire approach to professional auditing had to be changed and uplifted.*

Two decades later, Justice Moffit's findings in the landmark *Pacific Acceptance (1970)* case, formalised more generalisable, yet considerably more specific, standards of care and skill than we had previously seen in the courts, including the duties to check and see for themselves, rather than rely on client representations, to closely supervise and review the work of junior audit team members, and to take further action when misstatement is suspected. This Australian development corroborated Lord Denning's finding in the United Kingdom, wherein he stated at section 23 of *Fomento (Sterling Area) Ltd. v Selsdon Fountain Pen Co. Ltd. (1958*) that:

> *To perform his task properly he must come to it with an enquiring mind - not suspicious of dishonesty - but suspecting that someone may have made a mistake somewhere and that a check must be made to ensure that there has been none.*

The *Pacific Acceptance (1970)* case was instrumental in prompting attention to improvement of Auditing Standards, recognising that adherence to inadequate and/or outdated standards constituted no defence for auditors (Gibson & Arnold, 1981), and Justice Moffit's requirement to "check and see" was reinforced by Justice Owen in the HIH Royal Commission Report (Commonwealth of Australia, 2003), who found that the auditors relied unduly on others (at 21.6.3); subsequently leading to a number of important recommendations regarding auditor independence (Blake Dawson Waldron, 2003), noting its potential incompatibility with professional scepticism. Specifically, Justice Owen concluded (at 21.4.5) that "One consequence of an auditor exercising appropriate levels of professional scepticism and independence in the course of an audit is that tension may arise in the course of the relationship between auditor and client." The rulings in the above legal cases set the foundation for regulatory developments as well as professional and academic discourse that have helped us to refine our understanding of reasonable care and

skill, and subsequently, the more specific aspect of auditor judgment which is now known as professional scepticism.

Notwithstanding, professional and academic literature continues to offer varied descriptions of the essence of professional scepticism (Glover & Prawitt, 2014; Westermann et al, 2014), rather than a single universally accepted understanding (Nolder & Kadous, 2014; Quadackers et al, 2014). This divergence increases the challenge of measuring and further understanding it (Rasso, 2015; Grenier, 2014; Hurtt et al, 2013; Nelson, 2009; Van Peursem, 2010). For the purposes of this research, with a view to measurement firmly in mind, it is essential to establish specific factors that comprise professional scepticism. To that end, this chapter is focused on defining the parameters of the regulated requirements and specifying factors which clearly describe the essence of professional scepticism as reported in auditing and related literature.

Scepticism is often inconsistently defined and applied in various contexts from colloquial to professional usage (Van Peursem, 2010). Colloquially, the term is often used to express a position of disbelief, or even cynicism, which suggests a bias toward doubt, mistrust or suspicion. Nelson's (20009) use of the term 'presumptive doubt' suggests a moderated variant of this stance, bearing in mind that a cynical (or very doubtful) attitude would lead to over-auditing and inefficiencies (Glover & Prawitt, 2014), though this appears to be the expectation of regulators conducting quality audits of the firms' work (Nelson, 2009; Glover & Prawitt, 2014). The term's Greek origin, 'skeptikos', is more focused on being ''inquiring or reflective'' (Glover & Prawitt, 2014, p.P2), which is more aligned with an attitude of maintaining an objective, or neutral, position, free of assumption or bias, until such time as evidence identifies whether a particular management assertion is to be accepted or rejected.

A professional is expected to possess knowledge and skill beyond that expected of a reasonable lay-person (Cambridge University Press, 2015). Accordingly, scepticism has a more explicit meaning in an audit sense, encompassing due diligence and a standard of care (Glover & Prawitt, 2014, p.P2). Consistent with the American definition (PCAOB, 2012b), the International Auditing Standards define professional scepticism as (AUASB, 2013b, para. 13(l)): "...an attitude that includes a questioning mind, being alert to conditions which may indicate possible misstatement due to error or fraud, and a critical assessment of evidence".

There are a number of issues that derive from this definition and at times raise the question as to whether there are significant differences between the lay and the professional interpretations about what we mean by scepticism other than the jargon used. Concerns such as 'a questioning mind' and 'alertness' appear to be common. However, the distinction would seem to be in the light of reference to 'alertness' and 'critical assessment' that might be expected. Of interest to this research is the potentially different attitude that a qualified professional, as compared to a layperson, might bring to the table. That is, an attitude of merely opining, rather than asserting anything (Liddell and Scott, 1940 in Van Peursem, 2010) or presuming doubt (Van Peursem, 2010; Nelson, 2009). Such a stance represents clear objectivity.

Despite a substantial body of research and regulatory body publication regarding professional scepticism, ambiguity of terminology in the definition and variations in interpretation continue to vary (Glover & Prawitt, 2014; Nelson, 2009). Therefore, the various aspects of the audit definition are explored in more detail in the following sections.

2.3 Scepticism as a Trait

Prior research, such as that published by Hurtt (2010) and Nelson (2009) identifies the *attitude* of professional scepticism as a trait. Trait theory holds a view that behavioural traits are predispositions of biological origin, and they are therefore considered innate (McLeod, 2014; Mooradian et al, 2006). This means that trait scepticism is a tendency to behave in a certain way, and that the behaviour will manifest in a reasonably consistent way (McLeod, 2014). In the context of professional scepticism, this view is supported by Carpenter & Reimers (2013), who assert that scepticism is not readily susceptible to internal or external influence. As such, it could be expected to remain reasonably stable over time (McLeod, 2014; Peytcheva, 2014; Rose et al, 2010; Carpenter & Reimers, 2013; Hurtt, 2009). McLeod (2014) explains that "theories are sometimes referred to as psychometric theories, because of their emphasis on measuring personality by using psychometric tests." Indeed, numerous studies have utilised trait methods to measure auditors' scepticism relative to other auditors.

Hurtt (2010) developed a scale to measure professional scepticism in terms of a "relatively stable" trait (Hurtt, 2009, p. 150), which has been applied to numerous research projects[5]. The survey instrument addresses six characteristics of scepticism: "A questioning mind, suspension of judgment, [need to] search for knowledge, interpersonal understanding, self-esteem and autonomy" (Hurtt, 2010 p.151), and reflects a regulatory perspective of scepticism (Westermann et al, 2014).

[5] For examples, see Rasso, 2015; Harding & Trotman, 2015; Peytcheva, 2014; Carpenter & Reimers, 2013.

Another trait measurement tool previously used to measure auditor scepticism [6] is the Wrightsman Trust Scale (1991). Like scepticism, trust has been identified in the academic literature as a trait, or propensity, which differs between individuals, but remains relatively stable in individuals over time (Rotter, 1980; Chughtai & Buckley, 2008). Chughtai and Buckley (2008) distinguish the trust trait from a state of trust (see also Rotter, 1967; Mooradian et al, 2008). The trust trait is held to be an important determinant of the trust state (Chughtai & Buckley, 2008), and that state itself is variable across time and in different contexts, subject to external influences. In these ways, the study of trust resembles recent study of professional scepticism.

Further, Chughtai and Buckley (2008) describe a connection between trust and belief. Mooradian et al (2008) describe belief as an extreme of trust, with cynicism its corresponding opposite; akin to optimism and pessimism, respectively. These concepts are important to study of professional scepticism, because trust is a known threat to auditor independence, and the fundamental purpose of independence is to facilitate professional scepticism.

In the auditing context, exploring trust as a factor of scepticism illustrates how belief is relevant to the notion of scepticism by also relating to trust's corresponding opposite (Shaub & Lawrence, 1996; Quadackers et al, 2014): disbelief, or presumptive doubt (Nelson, 2009; Van Peursem, 2010; Glover & Prawitt, 2014), which expects a degree of client dishonesty (Nelson, 2009; Quadackers et al, 2014; Bell, Peecher, and Solomon, 2005). Both extremes thereby involve some degree of ex ante auditor bias.

[6] For examples, see Rose, 2007; Quadackers et al, 2014; Shaub and Lawrence 1996; Choo and Tan 2000; Rose, Rose & Dibben, 2010.

The notion of trust as a substantial factor in auditors' professional scepticism is supported by Luippold et al's (2015) findings that auditors' ability to identify earnings management is reduced by a propensity to be distracted by the client to focus on cleaner accounts. This suggests a siloed or myopic approach wherein management's representations are adopted as helpful (trusted), rather than recognised as potential diversions from less-pleasant truth. Low trust scores are considered a signal of higher scepticism (Rose, 2007; Hurtt et al, 2013; Quadackers et al, 2014). The effect of significant trust, therefore, is similar to the effect of significant distrust (presumptive doubt) in that both represent some degree of bias.

Trust is an important and valued human trait that facilitates relationships, both personal and professional. However, extreme trust in an auditor-client relationship represents a familiarity threat to objectivity (APESB, 2013), and may result in auditors under-assessing risk, over-relying on management representations, failing to collect sufficient appropriate evidence (Glover & Prawitt, 2014), and/or failing to evaluate the veracity of the evidence collected. Trust is therefore a significant aspect of audit risk; and in excess, it can be considered a precursor to expressing an inappropriate opinion when financial statements are materially misstated.

Extreme distrust is also a threat to audit, in that gathering of too much evidence, and completion of unnecessary audit tasks are inefficiencies (Glover & Prawitt, 2014) that increase firm costs and potentially damage auditor-client relationships due to increases in time taken and billed cost of services (Trotman, 2006). This threat does not expose auditors to regulatory or civil actions, as the excessive-trust threat can, however it does attract criticism (Trotman, 2006) and it may be argued that there are many more workplace pressures on auditors that deter inefficiencies than there are to deter trust. Workplace pressures that affect both these (dis)trust extremes, and act as barriers to scepticism, are discussed in section 2.7, below.

Harding & Trotman (2015) differentiate orientations of scepticism to explore differences between judgments and actions (Nelson, 2009), with "outward orientation focused on the veracity of management representations versus inward orientation focused on the justification of audit conclusions reached including evidence relied on" (Harding & Trotman, 2015, p.2). Using Hurtt's (2010) Trait Scepticism Scale, Harding & Trotman (2015) found no difference between treatment groups, meaning that although an outward orientation increases scepticism in actions, it does not appear to influence scepticism in judgments. This sticky outward orientation suggests that a position of (dis)trust in management assertions is not easily challenged, supporting the view that the scepticism trait is quite fixed (Cohen et al, 2014; Carpenter & Reimers, 2013; Hurtt, 2010).

Rasso (2015) and Harding & Trotman (2015) agree, having found that when *both* aspects of scepticism are engaged, auditors utilise more broad and comprehensive audit procedures and focus on higher quality evidence. In other words, if scepticism trait, expresses as anything other than neutral (that is, as trust, distrust or presumptive doubt), that trait arguably represents an inherent auditor bias, requiring that other, more flexible, behaviours compensate in order to deliver an objective and appropriately risk-responsive audit.

2.4 Scepticism as a Combination of Trait + Skill

Fukukawa & Mock (2011) and Anderson (2009, p.384) assert that many judgements are made by individuals on the basis of their personal beliefs, as well as their skills, while Nelson and Tan (2005) claim that audit opinions are influenced by a range of personal characteristics, including skill sets, as well as personality traits. As Hurtt (2009, p.150) explains, "professional scepticism can be both a trait (a relatively

stable, enduring aspect of an individual) and also a state (a temporary condition aroused by situational variables)."

Consistent with the International Auditing Standards definition, Grenier (2014) more specifically refers to the components of professional scepticism as a combination of both evidence scepticism *and* self-criticism. The former may be aligned with the trait aspect of scepticism, representing fundamental attitudes toward the evidence. The latter represents assessment of the manner by which the evidence is evaluated. Grenier (2014) found limited support for inward scepticism, but neither he nor Harding & Trotman (2015) conclude that skill alone is sufficient to increase scepticism. Harding & Trotman (2015) assert that both aspects, described in their study as inward and outward orientations, are necessary for the purpose of increasing professional scepticism, as neither is sufficient in isolation.

Clear distinction between how the trait and skill aspects of skepticism manifest is important, because it is the skill aspect that would be more vulnerable to context effects, given that traits are inherent and therefore invariable in the short term. However, professional skepticism also includes a situational characteristic to professional skepticism, with variability in expression being dependent upon contextual pressures and motivations (Westermann et al, 2014; Glover & Prawitt, 2014).

2.4.1 "questioning mind, being alert"

Van Peursem (2010, p.27) describes skepticism as *seeking* toward "possibilities of 'truths' of which [auditors] may not be aware", and uses the term "curiosity" (p. 24) to distinguish skeptical auditing from the ritualized activities that do not meaningfully assess evidence. Such curiosity is particularly important in audits of financial information prepared in accordance with principles-based accounting

standards, and across jurisdictions with varying degrees of standard precision (Grenier et al, 2015) because the range of possibilities is increased.

The problem of auditing in conditions of ambiguity is intensified in audits involving complex estimates (Frank & Hoffman, 2015; Rasso, 2015; Glover & Prawitt, 2014; PCAOB, 2012b), for example. Principles-based accounting standards are common (Grenier et al, 2015), but they also increase auditors' exposure to criticisms of judgment (Kadous & Mercer, 2012) and litigation (Grenier et al, 2015). Whilst principles-based accounting standards are more accommodating of diversity than rules-based standards, Grenier et al (2015) assert that they are counterproductive for audit because ambiguity encourages practices which undermine judgment. Conversely, it is also argued that rules-based standards are counter-productive to quality audit because they discourage thorough assessment of risks unique to specific audit engagements in favour of 'tick-box' auditing (Trotman, 2006), similar to the 'defensive auditing' mentality arising from litigation exposure (Brown et al, 2014).

Those with high tolerance of ambiguity (or low uncertainty avoidance) are likely to exhibit low levels of skepticism (Cohen et al, 1993; Hughes et al, 2009; Hurtt et al, 2013; Grenier et al, 2015) and this may be exacerbated by some cultural influences (Hughes et al, 2009). Grenier et al's (2015) solution to the risks arising from ambiguity is to gather evidence of making quality judgments that encompasses more than the following of auditing standards: Use of firm-devised judgment frameworks (Barrows et al, 2010) to "help auditors improve the quality of their judgments by more holistically considering complex issues" (2015, p. 339; Barrows et al, 2010), and even compensate for less rigorous technical expertise (Backof et al, 2014). However, Grenier et al (2015) note that whilst the outcomes are likely to exceed those from the use of computerized decision support tools, more evidence *of the process* may be necessary to defend against litigation in the event of audit failure.

Nonetheless, auditors tend to work at a lower level of abstraction (Rasso, 2015) because it is more natural, less difficult, and less time consuming (Frank & Hoffman, 2015), in practical audit situations. Of particular interest to this research is the notion of uncertainty (Peecher et al, 2013b) being introduced by the process of making judgements, in addition to the uncertainty surrounding evidence being evaluated. According to Frank & Hoffman (2015, p.3):

> *If being forced to process information in an unfamiliar manner increases participants' uncertainty regarding the task, it is possible that the differences observed with respect to ''perceived risk'' and ''likelihood of adjustment'' may reflect differences in uncertainty rather than, or in addition to, differences in skepticism.*

2.4.2 "critical assessment of evidence"

Van Peursem's (2010, p.24) description of evidence as an "instrument to assess truth" is useful because it not only highlights the central role of evidence in the process of auditing, but it also reminds us that it is not an answer in itself. Evidence, in all its forms, is that to which auditors must apply their skepticism – not only in judging the sufficiency and appropriateness of evidence gathered to reduce ambiguity, but also in being curious about the veracity of the evidence, and being self-critical about the ways in which such curiosity is applied.

Rasso (2015) explains that auditors make sequential judgments about evidence throughout the evidence collection process, informing decisions whether to continue seeking further evidence (after Gibbins, 1984; Knechel & Messier, 1990), and that improper interim judgments result in insufficient evidence, which is consequently interpreted by others as a lack of professional skepticism. In addition, Rasso (2015), after Griffith et al (2014), asserts that even experienced auditors have difficulty processing and synthesizing contrary evidence in particular, which should be interpreted as clues that gathering of further evidence is warranted.

Auditors must, therefore, be critical of their judgments (Harding & Trotman, 2015; Grenier, 2014; Peecher et al, 2013b; Bell et al, 2005); and Bell et al (2005) extend this by asserting that being self-critical is a *means* of exercising scepticism about one's own judgments (Grenier, 2014). Grenier (2014, p. 5) asserts that self-criticism is especially important to scepticism because it "facilitates specialist consideration of potential misstatements not readily discernible from the evidence". Like all humans attempting to make sense of information, auditors look for patterns (Wilensky & Resnick, 1999; Grenier, 2014), yet fraud schemes do not neatly follow patterns or present unequivocal red flags that enable clear identification. The patterns that do show are often subtle, and sometimes as patterns of omission, and the apparent red flags may be mere hints of a much more substantial story.

Auditors must not only obtain evidence that *persuasively* (AUASB, 2013b, para. 5) supports accounting assertions, but also question the quantity and reliability of that evidence, to the extent that they obtain "sufficient appropriate evidence" upon which to base an appropriate audit opinion (AUASB, 2013b, paras. A28:A31). This is particularly important because most audit evidence is supplied by the audit client organisation itself (AUASB, 2013b, para.A28); a party dependent upon obtaining an unmodified audit report, with the means, and potential motivation, to supply oral misrepresentations and/or false physical documentation which ostensibly support fraudulent financial assertions (Erickson , 2000; Wells, 2003; AUASB, 2013a).

Auditing Standard guidance material also notes that evidence includes information which contradicts assertions (Backof et al, 2014), as well as corroborative information (AUASB, 2013b, para. A28). While the nature of contradictory evidence is not elaborated upon, this is an extremely important concept to include because explicit acknowledgement is an enabler of objectivity, as described above.

Hurtt et al (2013) note that "audit standards, such as SAS 99 (AICPA, 2002) requires [American] auditors to adjust scepticism based on evidence obtained", reinforcing a notion that scepticism is not only controllable, but directly responsive to evidence. Encouragingly, Kizirian et al (2005) and Harding and Trotman (2015) have found this to be so.

However, in at least some instances, auditors are not sufficiently sceptical and do not obtain sufficient appropriate evidence (PCAOB 2012a, in Grenier 2014), particularly regarding aggressive assumptions and complex estimates (Backof et al, 2014; Griffith et al, 2014). In 80% of the SEC enforcement action cases studied by Beasley et al (2001), auditors "failed to gather sufficient evidence" – sometimes pervasively, and sometimes in some material area. In 40% of cases, auditors over-relied on management explanations and did not "challenge explanations that were inconsistent or refuted by other evidence the auditor had already gathered" (Beasley et al, 2001, p. 64). Generally in these cases, auditors failed to maintain an attitude of professional scepticism (Beasley et al, 2001).

Rasso (2015, p.11) presents a possible explanation:

> *…task complexity is negatively related with professional skepticism. More difficult tasks could actually induce higher skeptical action due to the increase in focus required by the higher difficulty. On the other hand, as suggested by the results in this study, higher complexity could cause an auditor to prematurely conclude a task, such as searching for audit evidence, simply because the task is cognitively draining. Such an end to the task could be later interpreted that the auditor failed to display an appropriate amount of professional skepticism.*

Although increased professional scepticism has been shown to increase evidence gathering (Harding & Trotman, 2015) it is not yet clear from the literature whether that evidence gathering genuinely addresses the requirement for "sufficient appropriate evidence" (AUASB, 2013d) or is merely busy-work; gathering a greater

quantity of evidence which may or may not be of appropriate quality or relevance (Harding & Trotman, 2015; Hurtt et al, 2013). This distinction between auditor judgments and actions (Harding & Trotman, 2015; Hurtt et al, 2013) is not yet resolved in the literature.

Auditing Standard guidance acknowledges that sometimes (AUASB, 2013b, para. A28) gaps arising from missing evidence, and/or refusal by management to supply requested information, constitute evidence. Auditors must acknowledge what they do not know (Grenier, 2014) and accommodate those gaps in their assessments and management of risk. Uninterrupted fraud schemes generally continue for well over a year (ACFE, 2002; Wells, 2003), and as perpetrators gain confidence as their scheme continues, they tend to become less fastidious about covering their tracks (Wells, 2003). They may even cease to produce false evidence or make false accounting entries that could make the transactions appear more authentic (Wells, 2003). Consequently, false 'evidence' for fraudulent transactions may be available for some accounting periods but not others. This inconsistency is an example of change which constitutes evidence and a red flag for risk reassessment.

Therefore, the mere existence of evidence is not an appropriate basis upon which to form a professional opinion that an assertion is supported: Auditors must first exercise professional judgement (AUASB, 2013b, paras. 16, A31) to form an opinion as to whether the evidence itself is reasonable: Whether enough has been accumulated (AUASB, 2013b, para. A29) to appropriately represent the entire population from which it is drawn, and whether it is of appropriate quality (AUASB, 2013b, para. A30).

But not all audit evidence is equal, in terms of reliability, persuasiveness, or even form. Backof et al (2014) draw upon a body of psychology literature to attribute lack

of scepticism when evaluating evidence to the manner in which evidence is presented, identifying particular difficulties with text form evidence, rather than problems with reliability or persuasiveness. As it is not feasible to insist that client representations be presented in a preferred graphical format (Backof et al, 2014) to make judgments easier (Wright, 1995), this research argues that auditors can utilise prompts (Grenier, 2014) to improve scepticism in terms of the *process* of evaluating text evidence.

Grenier (2014) attests that failure to identify fraud cues is due to auditors' overconfidence about their ability to evaluate evidence. That is, reliance on *information skepticism* (traits) alone, and ignoring, or under-utilising process skepticism (skill). This emphasizes the importance of the role of process skepticism skill, because "only Self-Criticism leads auditors to increase their consideration of potential misstatements (errors or fraud) that are not readily discernable from the evidence" (Grenier, 2014, p.23).

In light of all the above, skepticism *skill* may be considered the factor which is situationally responsive, applied in different ways, or to different degrees according to conditions, to complement or counteract an inherent skepticism *trait*, and elicit a situational mindframe which is consistent with a state of professional scepticism.

2.4.3 Learning Scepticism Skill

Hurtt et al (2013, pp 50, 54, 69) refer to use of *skill* to overcome biases and improve professional scepticism. Skills can be learned. Indeed, Luippold et al (2015, after Nelson, 2009 and Quadackers et al, 2014) assert that auditors are taught to exercise professional scepticism. Mastery of skill is subject to influences such as talent or aptitude (inherent ability), learning opportunities, refinement via practice, and encouragement. In other words, this suggests that the combined effects of training

and workplace practice should, over time, extend an individual's inherent position to construct increasing capacity for scepticism. This concept has been explored in academic research, and Peecher et al (2007), Knechel et al (2010) and Hurtt et al (2013) acknowledge that experienced auditors improve audit quality.

Nelson (2009) and Hurtt et al (2013) explicitly acknowledge experience and training as important facilitators of professional scepticism, and Hurtt et al (2013, p.51) clearly distinguishes this as being "in addition to" the underlying, and more static, scepticism trait. Nelson (2009) introduces the caveat that experience is helpful for professional scepticism *if* (emphasis added) it is appropriate experience: That is, experience which increases knowledge of "errors and non-errors and the patterns of evidence that suggest a heightened risk of misstatements" (p.7). Rose (2007) concurs that all experience is not equal, finding that general experience is not helpful, where fraud-related experience is.

Contrary to the above research findings, other research on experience-effects has found that *more* experienced auditors are *less* sceptical than their juniors (Pinsker et al, 2009; Payne and Ramsay, 2005; Grenier, 2014), apparently due to increased use of heuristics and grounding in past (mis)interpretation of anomalies, and are over-confident of their juniors' abilities (Peecher et al, 2013b). Cassidy and Buede (2009) agree, asserting that increased experience "is often accompanied by an unjustified increase in self-confidence" (p. 454), and even that expert judgements are generally "no better than chance" (p. 454). Other research asserts that auditors are reluctant to be self-critical of their judgments (Harding & Trotman, 2015; Grenier, 2014), attributing the reluctance to ego threat. These observed disparities reinforce the notion of skill learning by suggesting that professional scepticism can also be forgotten, or fall victim to a false sense that experience is a proxy for critical self-reflection upon one's thinking processes.

Glover & Prawitt (2014) recognise that current training, supervision and mentoring facilitates professional scepticism in audit firms, but suggest that further training, adoption of common terminology and consistent use of judgment frameworks will improve professional scepticism on an ongoing basis. Whilst Smith & Kida (1991) assert that biases seem to persist in auditors, Trotman et al (2009) propose that biases may be overcome by adopting a 'pre-mortem' approach to workplace brainstorming: That is, considering in advance, what might go wrong, with an approach that assumes the benefit of audit team hindsight. Hurtt et al (2013) highlight the influences that sceptical and non-sceptical seniors and supervisors may have on junior auditors over time, so it is important that in-house training, supervision and mentoring be modelled appropriately.

Formal education may play a more levelled role in this regard, with professional auditor education being particularly instrumental in development of professional scepticism skills (IFAC, 2010). Bazerman et al (2002) call for formal education to encompass understanding of biases, so that auditors may be better equipped to identify their errors and to deal with them appropriately. This would involve an individual recognising their own inherent trait position, so that they can practice the skills required to achieve an appropriately sceptical state. Hurtt et al (2013) propose that overcoming bias may be best addressed by education which trains auditors to consider information from alternate perspectives, similar to how law is debated (Pinsker et al, 2009) and more thoroughly understanding the underlying features of potential problems, such as Carpenter et al's (2011) finding that forensics training improves auditors evaluation of fraud risk.

Grenier (2011) asserts that telling auditors to be more sceptical is not effective; they must instead be primed to evaluate their thinking processes in the workplace and/or

trained to think differently about their own thinking processes (Hurtt et al, 2013). Prior research does offer other means of achieving this, including Plumlee et al's (2012) finding that auditors who are trained to generate alternate explanations for unusual evidence and to assess the plausibility of the explanations were more likely to arrive at an appropriate judgment of the circumstances. In addition to Plumlee et al's (2012) approach, Hurtt et al (2013, p.54) suggests that such training also include "considering multiple alternatives in addition to management's preferred alternative, and auditors challenging the thinking of other auditors". Peecher et al (2013a) also agree that auditors should also be trained to be sceptical of the judgments made by other audit team members.

In any platform, skill development is a mechanism by which those with lesser inherent abilities might learn to demonstrate capacity to perform at a level comparable with, and even in excess of, those who have relatively greater inherent abilities that have not been honed. It is also a mechanism by which those with sound inherent abilities might develop their abilities to an advanced level of competence.

For immediate purposes, this research accepts the assumption derived from the Auditing Standards that all auditors are capable of exercising scepticism. For that purpose, professional scepticism should be considered a product of both trait and skill because, after exclusion of outlier influences, suboptimal levels of trait scepticism can generally be *improved* by addressing associated skills, including capacity to respond to both intrinsic and extrinsic prompts to heighten scepticism as appropriate to situations involving risk. This premise is reinforced by existing research identifying facilitators of professional scepticism [7].

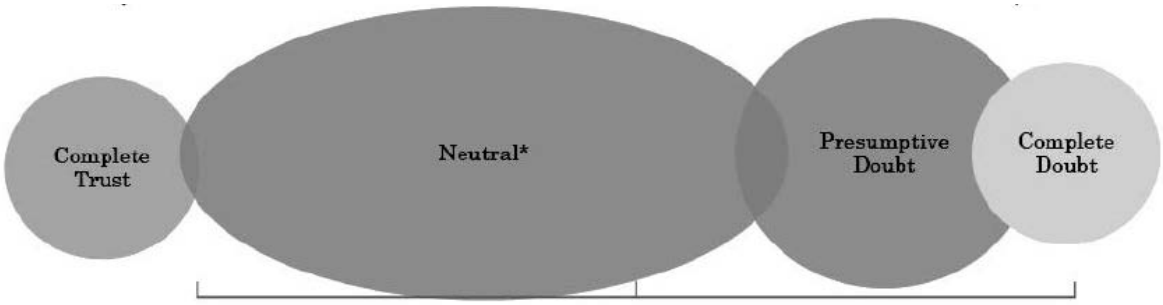
[7] Examples include Westermann et al, 2014; Glover & Prawitt, 2014; Beasley et al, 2001;

2.5 Levels of Scepticism

Prior research that finds that some auditors are more sceptical than others (Harding & Trotman, 2015; Grenier, 2014), provides evidence to support the notion of varying *levels* of scepticism. The term *insufficient* professional scepticism also attracts the attention of regulators (Harding & Trotman, 2015; Backof, 2014; Hurtt et al, 2013; Trompeter et al, 2013; PCAOB 2012a; CAQ 2010). Westermann et al (2014) refer to *degrees* of professional scepticism; and others explicitly refer to such as *levels* (Harding & Trotman, 2015; Glover & Prawitt, 2014; Hurtt, 2013).

Glover & Prawitt (2014) take the notion of levels further, placing characteristics of scepticism on a continuum, as illustrated in Figure 2.1, below. Glover & Prawitt (2014) intend that the continuum will be of ex ante help (O'Donnell et al, 2015) to auditors in applying scepticism matched to assessed risks, rather than as means of assessing auditors or measuring scepticism exhibited, and to enable consistent application of scepticism by auditors and quality reviewers alike. However, the authors acknowledge that guidance material should be developed to aid application of the continuum concept in practice. The authors' reference to a 'Neutral' perspective reflects regulatory intention that the auditor does not assume anything (Glover & Prawitt, 2014; Westermann et al, 2013; Hurtt, 2010); instead taking a position absent of bias (Quadackers et al, 2014; Nelson, 2009) and a purely objective approach to the evidence. As this explanation of professional scepticism is consistent with the requirements of the Auditing Standards and relatively unambiguous, Neutrality is the descriptor adopted for the purposes of this research.

Figure 2.1 A Continuum of Scepticism



SOURCE: Glover & Prawitt, 2014, p.P3

Glover & Prawitt (2014) also describe *a* continuum of *evidence assessment*, indicated by the line in Figure 2.1 which links the Neutral and Presumptive Doubt areas. In Gover & Prawitt's (2014) evidence continuum, less evidence is collected and evaluated at the Trust end of the continuum, constituting less effort, compared with more evidence at the other (Westermann et al, 2014), constituting greater effort (Peytcheva, 2014). The authors attribute a relationship between these continua to reflect perceptions of audit risk, wherein less evidence is required in low-risk scenarios that engender trust, and more evidence in high-risk scenarios that provoke distrust due to complexities, identified anomalies or inconsistent/contrary evidence (Glover & Prawitt, 2014). Failure to gather sufficient appropriate evidence aligns with insufficient professional scepticism (Beasley et al, 2001) and excessive trust (Glover & Prawitt, 2014). Accordingly, highly sceptical auditors efficiently alter their audit procedures in response to risk indicators (Carpenter and Reimers, 2013; Peytcheva, 2014), however Peytcheva (2014) highlights that it is important to recognise that increased evidence does not necessarily equate to increased *evaluation* of evidence (Peytcheva 2014).

Further, Kang et al (2015) note that sceptical *action* requires more than sceptical judgment. That is, an appropriate response (action) to audit risk is a consequence of

utilising professional scepticism for the purpose of gathering and evaluating sufficient appropriate evidence, appropriate to the risk. Sceptical disposition, or sceptical judgment, are not, of themselves, enough to reduce audit risk. The action, or outcome, which completes the scepticism process, would involve design of appropriate audit procedures, as well as documentation of those procedures and subsequent audit judgments.

Despite Glover & Prawitt's (2014) association of Neutrality with attitudes free of assumption (and therefore the greatest professional scepticism), they identify the entire continuum as a range of scepticism, with the professional range encompassing the entire Neutral and Presumptive Doubt areas, excluding only Complete Trust and Complete Doubt. The reasoning for the breadth of this professional range is not clear, however it is relevant that Neutrality and Presumptive Doubt are strongly represented because they are the two dominant perspectives of professional scepticism emerging from regulation and recent academic research, with no consensus as to which of the two is the most appropriate (Quadackers et al, 2014).

Whilst Glover & Prawitt's (2014, p. P4) continuum represents "gradations" of incrementally different scepticism levels, it does not distinguish a professional range from a range of scepticism that may be exhibited by a layperson who has neither the diligence of a professional nor the complete (dis)trust of a non-sceptic. Therefore it is not possible at this time to translate differences across the continuum to measure a professional level of scepticism.

Glover & Prawitt (2014) argue that auditors should (and therefore are able to) choose the level of scepticism they exhibit, and that it is important they choose different levels across the continuum which match the circumstances of their audit tasks. For example, in situations of heightened risk, sceptical auditors would adopt a

presumptive doubt perspective (Westermann et al, 2014; Quadackers et al, 2014). This capacity for change reflects the notion of 'state scepticism' (Nelson, 2009; Hurtt, 2010), and Glover & Prawitt (2014, p. P4) state that auditors must maintain their "questioning mind" at all points of the continuum so that they can respond appropriately in light of ongoing risk assessments. It is not clear whether the authors are referring to questioning of the evidence required/obtained (trait scepticism) or of the thinking processes utilised to evaluate it. Further, Glover & Prawitt (2014) do not identify how an auditor's scepticism is placed on that continuum by anyone other than the individual applying it, or by means other than that individual's judgment: Each individual's choice of scepticism to apply depends entirely on the individual's assessment of risk they perceive in the circumstances (Glover & Prawitt, 2014), and such assessments may be deficient (Beasley et al, 2001), influenced by unconscious trait biases.

Further complicating the challenge of defining a cohesive professional level of scepticism, prior research (Harding & Trotman, 2015; Carpenter & Reimers, 2013) observes no correlation between trait and state scepticism (Hurtt, 2013; Khan & Harding, 2013; Harding & Trotman, 2015). The authors suggest that these observations may reflect order effects in measurement, which could be addressed in further research (Harding & Trotman, 2015), but in any case the notion of some degree of independence between the factors is noted.

Consequently, a coherent measure of professional scepticism arguably must consist of a combination of both trait scepticism and its situational factor (Hurtt et al, 2013). Given the reasonably static nature of trait scepticism (Hurtt, 2010), and the more fluid, situational (Hurtt 2010; Westermann et al, 2014; Glover & Prawitt, 2014) nature of scepticism skill, the level of overall scepticism may be subject to change over time and/or under differing conditions (Glover & Prawitt, 2014).

2.6 Measures of Professional Scepticism

Numerous methods have been used in prior research to study auditor scepticism. Hurtt (2010) notes that it is difficult to draw inferences from such a body of research due to inconsistent measurement. Formal training is not an appropriate factor for measuring scepticism *skill*, or capacity to adopt a professionally sceptical state (Cohen et al, 2014; Westermann et al, 2014; Hurtt 2010), because all auditors undertake the same education (within same jurisdictions, if not comparable internationally); nor is experience an appropriate base upon which to measure scepticism skill, due to the inconsistency of research findings.

Some utilise audit tasks alone as a means of comparing auditor judgements to arrive at between-subjects measures. Examples include participant preparation of audit-related questions, and self-rating of perceived accountability and (dis)comfort (Kang et al, 2015). Examples of prior empirical studies that provide relevant background to inform the method adopted for this research are summarised in Appendix 2, beginning on page 226.

Such contributions from prior empirical research are very helpful for the purpose of clarifying relationships between scepticism-relevant variables. However, these studies do not employ methods which could be used to address the current research problem or research questions: None of these studies attempt to define a level of PS with which auditor performance can be compared, from either the Trait perspective or a situational State perspective. Further, there remains a missing link in the Trait and State discussion, being the situational variable(s) which interact with the relatively static Trait variable to influence the various States. Situational variables

are acknowledged and accommodated in some studies, but there is no consensus about definition. For the purposes of this research, that link is referred to as Skill.

Finally, the vast majority of prior studies utilise audit scenarios and recruit auditors as subjects, which does not facilitate inclusion of others for the purpose of differentiating a Professional Scepticism level from alternate levels of scepticism. Audit-specific tasks can not be administered to non-audit participants because they will not understand how to do what is required for the task.

Therefore, to achieve the objectives of this research, it was necessary to focus upon the prior conceptual literature, which discusses levels of scepticism, and offers potential explanations for the variables which link trait scepticism to various scepticism states. The conceptual literature was drawn upon to develop a research model to enable exploration of the Skill variable, and to the broader psychometric literature was explored for the purpose of adapting an appropriate scepticism measurement method to accommodate that model.

Studies which address the trait aspects of scepticism utilise instruments such as Hurtt's (2010) Scepticism Scale, and the Wrightsman (1991) and Rotter (1967) Trust Scales, introduced in section 2.3. Quadackers et al (2014) propose that the Hurtt (2010) scale measures scepticism from a Neutrality perspective, whereas an inverted trust scale (Rotter's 1967 scale) measures scepticism from a Presumptive Doubt perspective. Comparing the two scales in an audit-task experiment, Quadackers et al (2014) found that they equally predict professional scepticism in low risk conditions, but only the inverted trust scale results were significant in high risk conditions, which is attributed to Neutrality being less effective than Presumptive Doubt in circumstances where heightened scepticism is necessary. Given that higher risk audits are of greatest concern to auditors, Quadackers et al (2014) suggest that their

use of an inverted trust scale provides a generally more reliable measure of professional scepticism than the Hurtt (2010) scale.

In some studies, the Hurtt (2010) scale has signalled no significant difference in professional scepticism between manipulated groups (Carpenter & Reimers, 2013), which is attributed to the fixed nature of a trait (Cohen et al, 2104; Carpenter & Reimers, 2013; Hurtt, 2010) as measured by this scale. However, despite acknowledging that professional scepticism consists of both trait and skill aspects (Cohen et al, 2014; Westermann et al, 2014; Hurtt, 2010), both the above types of scales attempt to measure only the trait aspect. Hurtt (2010) notes that use of single-dimension constructs to measure professional scepticism make it difficult to identify which sub-construct is being measured.

Other research [8] attempts to measure both aspects, but do so using a combination of the Hurtt (2010) trait scale plus a series of audit tasks. However, in such studies, the task results do not combine with the trait scale results in such a way as to provide an overall single measure of professional scepticism. Also, the tasks used in such studies are not appropriate for administration to non-audit participants to derive a 'professional' level of scepticism because the activities are audit-specific.

More recently, Peytcheva (2014) utilised combined measures. This project involved use of "two different state skepticism prompts … [one] based on the presumptive doubt view of professional skepticism … [plus] a cheater-detection prompt based on social contracts theory" (Peytcheva, 2014, p.28). This approach contrasts substantially with the other research described above because one of the constructs is reversed. That is, Presumptive Doubt has previously been associated with trait scepticism, such as in the work of Glover & Prawitt (2014) and Quadackers et al

[8] For example, see Khan and Harding, 2013; Carpenter & Reimers, 2013.

(2014). However, it is consistent that Peytcheva (2014, p. 28) refers to the Social Contract mechanism in terms of "activating" a "frame of mind", which has previously been associated with the more fluid scepticism. In this sense, the Presumptive Doubt construct is applied to explore whether an appropriate state has been invoked by the use of scepticism prompts. This measure (involving assessment of audit-specific task performance, given the presence or absence of prompts, against a normative solution) was more successful for students, but not auditors, than the cheater-detection prompt, which produced no effect for either group (Peytcheva, 2014). The Hurtt (2010) scale was utilised to measure trait scepticism, though no significant differences were observed between groups, and overall results were again significant for students but not auditors (Peytcheva, 2014).

A further consideration, highlighted by Peytcheva (2014) is that more must be understood about the relative importance of trait versus state scepticism (Nelson, 2009; Hurtt, 2010; Carpenter and Reimers, 2011; Peytcheva 2014) when constructing an overall measure.

2.7 Limitations of Professional Scepticism

The development and manifestation of sceptical behaviour is subject to a range of internal and external influences, including regulation, education, religion, social and workplace conditioning and norms, and life experiences. Barriers may include identifying what scepticism actually is, gaps in identified competence between audit standards and the identification of fraud in general.

In attempting to understand reasons for sub-optimal professional scepticism, prior research (Westermann et al, 2014; Hurtt et al, 2013) has identified numerous factors that may positively and negatively affect how and when it manifests. Among these,

is Westermann et al's (2014, p.4) finding that workplace pressures can be barriers to effective scepticism (Hurtt et al, 2013; Svanström, 2015), including "inspection, litigation risk, client importance, time-budget pressure, workpaper review and formal evaluation". Such barriers have also been noted in other publications (including: Nelson 2009; PCAOB 2012a; Hurtt et al. 2013; Westermann et al, 2014; Vera-Muñoz, 2015), along with documentation practices (Van Peursem, 2010; Rasso, 2015; Westermann et al, 2014); partner and supervisor attitudes and expectations (Carpenter & Reimers, 2013; Peecher et al, 2013b) and even audit regulation (Glover & Prawitt, 2014; Peecher et al, 2013b). Van Peursem (2010, pp. 24, 27) adds poor planning, cost cutting, and over-reliance upon systems and computer-assisted techniques to that list. Further, common auditing procedures may exacerbate the problem in that the veracity of procedures may be overestimated, with those involving detailed instruction or specific interpretation inhibit professional scepticism (Rasso, 2015). These factors increase the possibility that negative influences may outweigh the positive influences in some audits.

The above research highlights that the expression of a sceptical attitude is influenced by auditors' intrinsic properties, as well as by numerous extrinsic factors, but it is not yet clear whether the degree of positive(negative) extrinsic influence is offset or amplified by individual auditors' intrinsic abilities.

However, scepticism is both a personality trait (Hurtt, 2010) and a cognitive function (Birnberg, 2011), and the varying degrees of scepticism exhibited by auditors are necessarily influenced by varying degrees of self-interest and rationality (Nelsona et al, 2003). Following their study of SEC Enforcement Actions, Beasley et al (2001) assert that "in many of the fraud cases, it appeared auditors simply chose not to pursue identified audit issues" (Beasley et al, 2001, p. 65). Some possible ethics-related explanations for this behaviour is provided, but Beasley et al (2001) do not

describe the basis for that causality. In a study of New Zealand audit failures, Van Peursem (2010) attributes audit failures to ritualised audits, arising from professional structures and legitimating practices that inhibit scepticism.

Mintz (1995) suggested that the behaviour gap between knowledge and actions is resolvable only by normalising detailed analysis. However, Rasso's (2015) view is that even senior auditors have difficulty assimilating details to form a big picture view. Such a view would facilitate identification of gaps, though Rasso (2015) further asserts that auditors are not good at recognising patterns in the evidence even when that evidence is complete, and fail to accommodate negative evidence.

Mintz' (1995) stance, however, may be considered an extension of Bastiat's (1845) enduring assertion that *terminology* must be normalised, reducing the mystery surrounding the term 'fraud'. Openness is the antithesis of fraud, and normalisation is the connection between theoretical knowledge and personal experience. Normalising cognitive challenges is not so simple though: Emotional influences are under-researched (Hurtt et al, 2013), and therefore stress responses, mood and other factors which may impact upon responses to risk are poorly understood. Nolder (2012) suggests that this is an important and under-researched area as auditors' emotional reactions in high-risk settings can influence their level of skepticism. She notes, ''In general the risk research provides strong evidence to suggest that an auditor's affective response to risks significantly contributes to variations in his/her skeptical judgments and actions'' (Nolder 2012, 11).

Further influences are neurobiological, such as prefrontal cortex influences on rationality and manifestations of self-interest. For example, Fleming, Thomas & Dolan (2010) have found that activity in the subthalmic nucleus area of the brain

signifies stress and human predisposition to avoid difficult decisions and challenges to the status quo, suggesting that auditors may resist identification of material fraud.

Prior research has revealed that human capacity to exhibit scepticism is influenced not only by how we *utilise* our brains, but also by the structure, chemistry and electrical activity in our brains. Previous studies of auditor behaviour in general, and of scepticism in particular, identify environmental and cognitive/emotional barriers to professional scepticism in auditors, but ignore neurobiological factors which are inextricably interconnected with the cognitive and emotional factors that influence human perception of evidence and the various stages involved in evaluation of that evidence. Examples of these biological factors, which may be barriers in themselves, and/or underpin whether, and how, the other barriers manifest, are explained in the remainder of this section.

When misstatements or anomalies are identified, individuals may rationalise that what they have found is an error, rather than a signal of possible fraud. These types of false rationalisations are formed with faulty logic (Nelsona et al, 2003). Thus even natural propensity for scepticism can be impeded by false logic and biases in the application and interpretation of data. One such impediment is confirmation bias (Trompeter & Wright, 2010; Hurtt et al, 2013; Fukukawa & Mock, 2011), which appears particularly problematic in terms of management representations.

The frontal and prefrontal areas of the human brain are utilised for complex thought, such as hypothesis and criteria evaluation, risk assessment and decision making (New Scientist, 2010). This area of the brain also stores past perceptions (New Scientist, 2010), suggesting that it may also be responsible for heuristic influences which may introduce unconscious biases to simplify complex tasks.

The prefrontal cortex develops most significantly in early adulthood, and has been positively correlated with maturing capacity to assess risk. This development is vital to the audit process because the purpose of the requirement to exercise professional scepticism throughout audit is to enable continual assessment of audit risk; that is, the risk of forming an inappropriate audit opinion. On this basis, it could reasonably be expected that younger auditors are less sceptical than their seniors. This is of interest because much of the coal-face audit work is undertaken by junior audit team members, and the audit opinion is formed on the basis of that work, signed off by experienced auditors. However, such a proposal is inconsistent with prior research findings that suggest junior auditors are more sceptical than their seniors, as discussed above at 2.4.3. A possible explanation for this conundrum may be that junior auditors may require more evidence upon which to base their judgments, as compensation for lacking the heuristic benefits of experience. Alternatively, as Hurtt et al (2013) suggest that audit seniors' accountability for client retention might explain their relatively lower scepticism.

In the absence of a benchmark of professional scepticism, this relative comparison is not entirely useful though: It is possible that senior auditors *are* exhibiting professional scepticism and that the 'more sceptical' juniors are excelling. At face value, the above concepts suggest a brief window of 'most optimal' scepticism in early-career auditors with perhaps only two or three years' experience. Future research that clarifies this may contribute knowledge of significant interest to academics, professional bodies and professional practitioners in terms of audit team structure, professional development and audit partner rotation practices.

To further complicate the task of evaluating one's own thinking processes (scepticism skill), auditors may need to undertake their evaluations in unique ways, because it is noted that individuals are subject to different biases and undertake

different thinking processes as a result of unique brain development and accumulated life experiences (Peecher et al, 2013b). Further, activity in the subthalmic nucleus area of the brain appears to predispose decision makers to avoid difficult decisions in favour of maintaining a status quo (Fleming, Thomas & Dolan, 2010). Suggestion that humans are hard wired to avoid scepticism may help explain suboptimal judgements even by auditors with ostensibly well-developed analytical skills.

2.8 Summary

The assumption in the Auditing Standards that a *professional* level of scepticism can be exercised by *all* (AUASB, 2013b) audit team members is undermined by evidence that neurobiological influences may present a natural, base-level impediment to professional scepticism. Further, this inherent impediment may be exacerbated, to a greater or lesser extent, by personal biases and external conditions that also present barriers to professional scepticism.

As facilitators (prompts) of professional scepticism are offered in the literature, it is argued that auditors who exhibit traits that are not professionally sceptical, could achieve professional scepticism by developing skills to apply such facilitators to compensate for the inherent shortfall and achieve a state of professional scepticism. Such skills would be required to a lesser or greater extent in different individuals, and, as auditors are required to exercise professional scepticism throughout the audit process, those skills may be required to maintain the mindframe at all times, and not only in response to higher or lower levels of assessed risk.

Chapter 3: Developing a Research Model

3.1 Introduction

In this chapter a research model is developed to explore professional scepticism and its component parts, to devise an approach to measuring scepticism, and more specifically to identify an approach to measuring a professional level of scepticism.

3.2 Problem-solving framework

A major challenge was the identification of a problem-solving framework appropriate to address the initial research question: No single theory of professional scepticism is available to address all components of this question. Equally, Nolder & Kadous (2014, p. 1) note that there continues to be a "lack of a guiding [conceptual] framework [and this] precludes researchers from building on each other's work in a systematic way".

In their study, Nolder & Kadous (2014, p.34) offer a proposed [conceptual] framework for researching auditors' judgment to provide a "practical means of identifying root causes of and correcting auditors' failure to exhibit sceptical behaviour". Nolder & Kadous (2014) reject the trait approach to understanding scepticism because traits are held to be stable and difficult to change, which presents a bleak outlook for improving audit quality. Instead, they develop a model which links Cognitions, Affections and Conations to describe professional scepticism as a construct which can be improved. Nolder & Kadous (2014) also criticise trait measures as "general response tendencies in the abstract" (p. 7) because greater specificity is necessary for the purpose of making reliable predictions about behaviour. Their conceptualisation takes auditor attitudes to evidence into account,

which is highly compatible with the approach in this thesis. However, the example Measure of Attitude of Professional Scepticism Components (Nolder & Kadous, 2014, pp. 35-37) is audit-specific and therefore unsuitable for administration to the general public for the purpose of observing a broad perspective of scepticism, from which to differentiate a professional level of scepticism. To answer the research question, it was necessary to explore and draw upon a variety of prior works to construct a project-specific problem solving framework which would apply beyond the specific auditing context. This was achieved by identifying scepticism-relevant constructs in audit regulation and academic literature, and combining them into a composite framework useful to satisfy the requirements of the research questions.

The process of developing the [conceptual] framework is described in the following sections, and the outcome is presented as a Model of Professional Scepticism.

3.3 Trait Scepticism

In auditing regulation, professional publications and academic research, dominant themes explaining auditor scepticism are *attitudes*, and *propensity* to exercise the appropriate attitudes. These issues are identified as trait characteristics (Hurtt, 2009), which influence how evidence is interpreted and utilised to inform judgments.

Traits are considered to be stable characteristics (Peytcheva, 2014; Rose et al, 2010; Carpenter & Reimers, 2013). As individuals have relative differences in beliefs and attitudes, it can reasonably be expected that the trait platform potentially introduces varying degrees of personal bias into the process of judgment making. A wide range of attitudes toward information/evidence in the general community may represent a wide range of biases if those attitudes reflect different propensities to accept or challenge information/evidence. Auditors, however, are all expected to have the

same attitude to evidence, and that attitude is far more constrained than could be expected of the general community: That is, auditors must maintain an open mind, free of bias, accumulating sufficient appropriate evidence until such time as a judgment is manifest.

3.3.1 Professional Biases

Poor judgment has previously been explained in the literature on anchoring heuristics, recognition heuristics and higher order thinking. Butler (1986) claims that anchoring is widely used by accountants, and that anchoring is predominantly internal, and remains unaffected by new cognitive information. This means that auditors will expect to experience in the future more of what they have personally experienced in the past, and those who have not experienced a range of financial misstatements (or fraud) are likely to believe they never will, and therefore they will be less alert to such misstatements that do arise, even if they understand, hypothetically, that it is a possibility. Therefore, over time, personal experience which reinforces cognitive shortcuts can constrain knowledge (Bastiat, 1845; Butler 1986; Mintz, 1995; Hall, 1996; Burns, 2002), and reinforce the Trait propensity to expect more of the same in future.

This suggests that experience is a subjective influence, and therefore it is potentially a barrier to professional scepticism.

3.3.2 Neutrality

More consistent with the Auditing Standard requirement that auditors maintain an attitude that includes a questioning mind, and to critically assess evidence (PCAOB, 2012b; AUASB, 2013b), are the concepts of Neutrality and Presumptive Doubt (Nelson, 2009), which were introduced in Chapter 2. Glover & Prawitt (2014) place

scepticism on a continuum, with the professional range encompassing the Neutral and Presumptive Doubt perspectives described by Nelson (2009), and excluding only Complete Trust and Complete Doubt at the extremes.

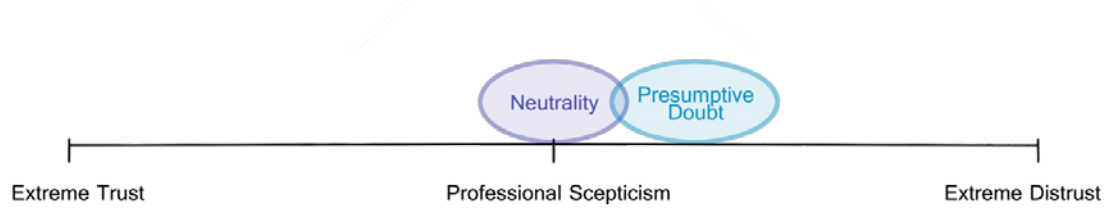
Although the literature does not establish which of these perspectives most appropriately represent professional scepticism (Quadackers et al, 2014), this research argues that the Neutral perspective most closely represents the auditor's role of merely opining on the basis of the evidence, rather than asserting anything (Liddell and Scott, 1940 in Van Peursem, 2010; Cohen et al, 2014), and the obligation to maintain an objective position, free of assumption or bias. Neutrality, or objectivity, is therefore aligned, for the purposes of this research, with ideal professional scepticism wherein sufficient appropriate evidence speaks for itself.

In acknowledging this, it is therefore appropriate to shift Glover & Prawitt's (2014) continuum placement of Neutrality so that it is centred to align with the point of objectivity, representing 100% scepticism. This is consistent with the requirements that Auditor judgements must be made in the public interest (APESB, 2013; Beasley et al, 2001) and in compliance with the Code of Ethics for Professional Accountants, rather than in the interests of the auditor, or the interests of the audit client (APESB, 2013). This supposes that auditors can exercise appropriate objectivity with which to evaluate the interests of a diverse body of financial statement users, and assess the materiality of any misstatements in terms of whether the decisions of those users might potentially be affected.

On a continuum from one extreme to the other, there will be relative changes through neutral and presumptive doubt, and until evidence is available to the contrary, such changes could reasonably be assumed to be incrementally consistent. Therefore, in the continuum adopted for this research, at least the end parts of the 'professional'

range of Glover & Prawitt's (2014) model, which was presented at Figure 2.1 on page 41, should be retracted somewhat to recognise a more gradual transition from 'complete' (dis)trust to professionally sceptical, and to accommodate levels of lay scepticism which fall short of 'professional'. This extension of Glover & Prawitt's (2014) model is illustrated in the following diagram:

Figure 3.1 A Neutral view of the Scepticism Continuum



AFTER Glover & Prawitt, 2014

Such a shift results in movement of Presumptive Doubt to the field between Neutrality and Distrust/Extreme Distrust. This movement does not defy the principles expressed by Nelson (2009), but it does support a nexus between the works of Nelson (2009) and Glover & Prawitt (2014) whilst also accommodating the concept of incremental transition across the trait spectrum.

Evidence is expected to feature greatest in judgments made from a neutral, or sceptical, position, with lesser weighting applied to those judgments which are also informed by trust or distrust biases (Cohen et al, 2014). Glover & Prawitt (2014, p.3) agree, proposing a continuum of evidence behaviours which correspond to their proposed scepticism continuum, enabling auditors "to take the perspective that is most appropriate considering the circumstances applicable to each audit area and assertion". This means that Glover & Prawitt's (2014) evidence curve is straight,

ranging from very little evidence at the Trust end (in situations of low risk) and extensive evidence at the Complete Doubt end of their continuum (in situations of high risk, demanding a heightened scepticism approach).

However, "it is important to keep in mind that applying such a continuum to a specific account and assertion takes place *after* a careful and rigorous initial risk assessment" (Glover & Prawitt, 2014, p.3). This means that different parts of any audit may involve behaviours at very different points on their evidence continuum, which is preferable because "taking a presumptive doubt approach for the whole audit would result in over collection of audit evidence in many areas and result in a suboptimal balance of effectiveness and efficiency" (Glover & Prawitt, 2014, p.2). That is, Glover & Prawitt's (2014) evidence line refers to conscious behaviours, responsive to considered risk assessments.

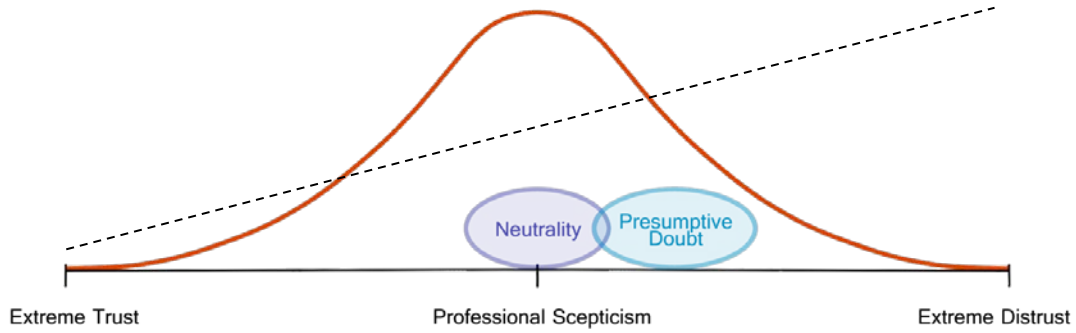
At this point, I extend Glover & Prawitt's (2014) model to acknowledge relative differences in degrees to which evidence speaks for itself in formation of judgments from a *default* position, in the absence of risk assessments and/or any prompts to increase scepticism. In the default position, professional scepticism is influenced by the interaction of Trait and any Skills, at a subject's disposal, but not required in default situation. This means that when Skills are latent, attitudes to evidence will be dominated by the inherent Trait attitude. Therefore, in situations which do not involve risk assessment, or other prompts to engage scepticism-related Skills, propensity to evaluate evidence will depend upon the subject's Trait position.

At the Extreme Trust and Extreme Distrust ends of the Trait continuum, subjects are similarly biased in pre-emptive belief or disbelief. At these extremes, no evidence will be utilised in the formation of judgments that arise from biases unless a situation requires them to engage Skills that influence their behaviour toward heightened

scepticism. This contrasts with the Neutral (Professionally Sceptical) default Trait position, where judgments are formed purely on the basis of evidence, regardless of situational requirements.

In the following diagram, Glover & Prawitt's (2014) evidence approach, from an informed risk-assessed position, is depicted by the dashed line, and the weighting of evidence considered when making judgments from a default position is depicted by the red line. Both evidence depictions are consistent with the premise that higher scepticism involves more evidence (Glover & Prawitt, 2014), but potential differences in evidence behaviours may arise according to situational needs and interplay with the inherent disposition of the subject.

Figure 3.2 Relative Weightings of Evidence



AFTER Glover & Prawitt, 2014

The roles of trust and distrust and explored further in the following sections, along with continuing discussion of the relationship between biases and evidence.

3.3.3 (Dis)Trust

Trust is one type of inherent bias, and is connected to existing beliefs (Khan & Harding, 2013) and directly influences how information is perceived and

accommodated. Humans are predisposed to trust (Fleming, Thomas & Dolan, 2010), and trust can prevail against opposition until such time as evidence of sufficient weight and/or proliference causes the person to evaluate the merits of his/her position of trust toward the subject matter.

This means that judgments made under condition of trust may be arrived at on face value of evidence, or even without critical evaluation of any evidence. Even though trust can be revoked in light of sufficient appropriate evidence, such evidence may not be immediately recognised by a trusting person. Trust is therefore counterproductive to fraud prevention and detection efforts.

Distrust is considered as the flip-side of trust, with biases due to distrust having similar impacts on evidence evaluation (Glover & Prawitt, 2014). On a continuum, relative changes in levels of presumptive doubt form a transition from neutrality to distrust. In the auditing context, the most notable difference between trust and distrust is that trust potentially exposes auditors to increased audit risk, whereas distrust potentially increases audit inefficiency. Audit risk is obviously of greater importance than inefficiency, due to the legal impacts and undermining of the assurance function. Nonetheless, as both biases are contrary to the expression of scepticism, both are relevant to the study of scepticism. Extreme biases, expressed as extreme trust or distrust, are expected to have the greatest negative impacts on expression of scepticism (Glover & Prawitt, 2014).

3.3.4 Extreme (Dis)Trust

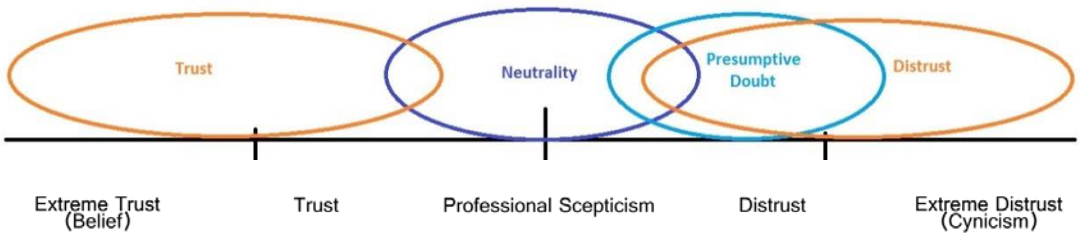
At its extreme, trust represents belief in that the relative importance of evaluating the sufficiency and appropriateness of evidence falls in favour of merely confirming expectations (McMillan & White, 1993; Bamber et al, 1997). Belief is “an

acceptance that something exists or is true, especially one without proof" which constitutes "a firmly held opinion" (Oxford University Press, 2015).

Like trust, belief is a socially desirable attribute in that it is essential for healthy interpersonal relationships, but it is problematic in an audit context because wholly subjective bias is completely contrary to professional scepticism. In an audit context, belief is highly undesirable because such extreme bias poses unacceptable audit risk. Extreme distrust, herein referred to as cynicism, is not a socially desirable trait, because it represents the polar opposite of behaviours that nurture relationships or circumstances. Cynicism is undesirable in an audit context also, because an attitude so biased that it consistently assumes all assertions are non-believable would be exceedingly counterproductive.

Glover and Prawitt's (2014) continuum is consequently extended to accommodate incremental changes in trait positions, extending from a position of greatest trust bias (belief), through neutrality, to the opposite extreme of cynicism, as depicted in the following figure.

Figure 3.3 A Composite Trait Continuum



This diagram is now adapted to indicate relative levels of bias across the continuum. In the following figure, the red line illustrates the transition from greatest levels of

bias at the extremes of the continuum, through zero bias at the point of greatest neutrality.

Figure 3.4 Relative Positions of Bias

Interestingly, this diagram curve also represents the persuasiveness of evidence necessary to alter the position of bias. The greater a person's trust or distrust toward a person, thing or idea, the more tolerant they will be of ambiguity, which means that evidence does not play an important role in judgments. Small quantities of low quality evidence are accepted to confirm expectations (McMillan & White, 1993; Bamber et al, 1997), but in order to revise beliefs from a strong bias position, evidence which contradicts beliefs must be more persuasive before it is accepted (Hurtt, et al, 2013). This is a problem for extremely biased auditors because tolerance of ambiguity has a negative association with scepticism (Cohen et al, 1993; Hughes et al, 2009; Hurtt et al, 2013; Grenier et al, 2015). This means that at both ends of the continuum, more evidence is required to change pre-existing expectations than is required from moderately biased position.

From a neutral perspective, no evidence is required to counteract biases, because biases do not set up expectations at the neutral position. Rather, the neutral perspective entails flexibility in the gathering of sufficient appropriate evidence, driven by risk indicators (Carpenter and Reimers, 2013; Westermann et al, 2014; Peytcheva, 2014; Glover & Prawitt, 2014).

In the following figure, the red line depicts the quality and quantity of evidence required to counteract the various levels of inherent bias.

Figure 3.5 Evidence Required to Counteract Bias

AFTER Hurtt et al, 2013.

The trait characteristics discussed in this section are presented in general terms, describing a broad range of generic attitudes that are expected to remain reasonably stable in the short and medium term. As such, the continuum of traits represents a generalised platform of collective trait positions. However, auditors, as a particular sub-set of people in general, are expected to maintain a professionally sceptical attitude, and must therefore consider whether their inherent position on the

generalised platform is appropriately sceptical, and if not, to adopt strategies to achieve an appropriate state of professional scepticism.

3.4 State Scepticism

Whilst it is recognised above that ideal expression of professionally sceptical traits would equate to ideal neutrality and freedom from bias, it is also acknowledged in the literature that scepticism may be situationally responsive (Brown-Liburd et al, 2013). Changes in scepticism level might arise internally, such as from the process of (re)assessing risk; or from external prompts that more or less risk may be encountered. That is, auditors may induce a state that will complement the trait position, correcting for any underlying bias, as appropriate to the situation at hand.

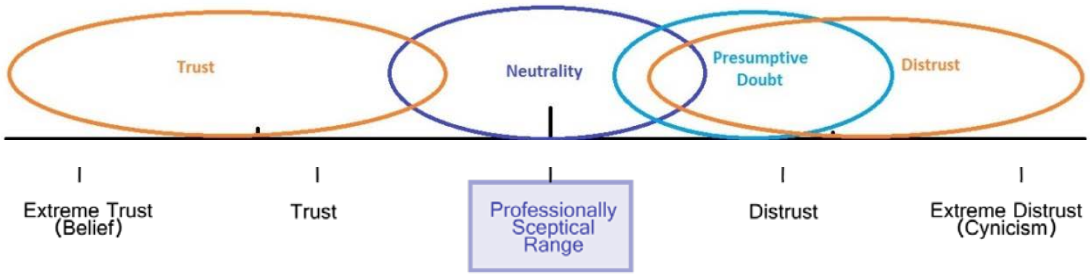
In suggesting that a state of less than 100% scepticism is acceptable, it is noted that extreme scepticism in situations of low risk would result in excessive effort and operational inefficiency. This suggests a range of professionally sceptical behaviours may be acceptable for the purpose of appropriately conducting an audit.

Until evidence is available to suggest otherwise, it is assumed that relative changes across the continuum, through neutral and presumptive doubt, from extreme to extreme, are incrementally consistent. Therefore, in this model, the outer parts of Glover & Prowitt's 'professional' range are contracted somewhat to accommodate incremental changes in scepticism which reflect the transition from professionally sceptical toward states which are more influenced by subjectivity. This mid-range of scepticism, between professional scepticism and biases, is referred to as lay scepticism for the purposes of this research. Some distinction between layperson and professional scepticism is warranted because Trotman (2006) argues that audit professionals attract even higher expectations of judgment accuracy than other

professionals, despite the requirement that they make such judgements about often highly ambiguous accounting practices and deceptively concealed fraud.

Without asserting limits to which such a range of states might extend, the concept of professional scepticism as a range of states, rather than an absolute position, is illustrated in Figure 3.7.

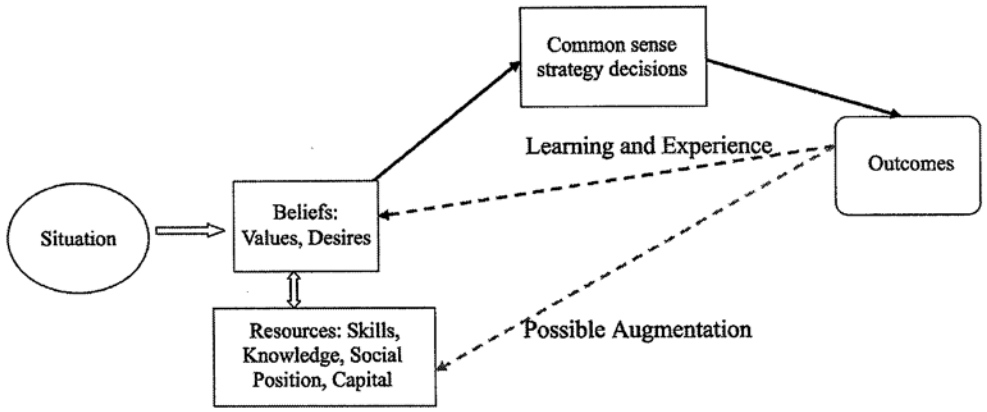
Figure 3.6 A Professional Scepticism Range



The professional range may or may not overlap with a range of scepticism exhibited by laypersons. According to the literature reviewed in Chapter 2, some prior research has found no significant within-group differences between scepticism levels of auditors and students, but differences between groups. Other studies identify relative differences between auditors with, for example, varying experience. It is possible that an appropriately sceptical state may be an individual's default mindframe, or a mindframe augmented to include more scepticism. Examples of augmenting factors include prompts arising from an individual's accumulating learning and experiences (skills), or from situational influences such as supervisor instruction; providing potential to improve upon a trait position to achieve a heightened state of scepticism when required. The relationship between these factors, and suggestion of a possible reinforcing feedback loop, is illustrated by

Anderson (2009) who developed the schema to model these issues in a broader judgment context.

Figure 3.7 The Role of Scepticism Augmentation



SOURCE: Anderson (2009, p.384)

Augmentation may arise externally, from prompts that enhance manifestation of sceptical attitudes or actions (Khan & Harding, 2013; Grenier, 2014). This concept is of particular interest because objectivity is defined as "a state or quality... intentness on objects external to the mind; external reality" (Houghton Mifflin, 2004; Random House, 2009). This is consistent with the earlier definition of scepticism generally, and also with the principle that audit judgments must be made in the public interest. However, a potential problem with external prompts is that initiation of appropriate scepticism, matched to (re)assessments of risk throughout the audit process, would be dependent upon the presence of reliably consistent external prompts, also matched to those (re)assessed risks. Such an expectation is likely to present an unrealistic supervision burden. Further, reliance upon external prompts may be unreliable if such use is subject to the limitations of theoretical (external) knowledge, identified above, wherein biases dominate over integrated (internalised) knowledge. Such a phenomenon may explain observations that sceptical judgments

do not always result in sceptical actions (Khan & Harding, 2013; Harding & Trotman, 2015).

The Auditing Standards require that *all* members of audit teams (AUASB, 2013b) maintain professional scepticism *throughout* audits (AUASB, 2013b), placing the onus on individuals to challenge their own judgment processes, as needed. This necessitates the use of internal prompts by those individuals whose inherent trait position is other than professionally sceptical, to achieve and maintain a state of professional scepticism.

The process of self-initiating scepticism prompts suggests that skills are necessary to recognise times of need for increased professional scepticism, integrate knowledge of suitable augmentation prompts, and to assess the efficacy of implementing those prompts. This would facilitate maintaining of a questioning mind during (re)assessment of risks and critical assessment of evidence. It is supposed that internalised prompts may give rise to more authentic sceptical behaviours, possibly bridging the gap between sceptical judgments and sceptical actions. It is further supposed that routine use of internalised prompts may become integrated to such an extent that trait shifts occur, over time, toward a more professionally sceptical inherent position. That is, an individual who possesses a high level of such skill may enhance a less-than-professionally sceptical inherent position to achieve a professionally sceptical state, appropriate to the circumstances.

3.5 Scepticism Skill

This research extends the prior research stance that professional scepticism is a product of both trait and state (Nelson & Tan, 2005; Anderson, 2009; Westerman et

al, 2014; Grenier, 2014) by proposing that a state of professional scepticism is a combination of trait and skill.

This research proposes that *skill* is the factor which is situationally responsive, applied in different ways, or to different degrees according to conditions, to complement or counteract an inherent skepticism *trait*, and elicit an overall state of professional scepticism. It is important to note that when auditors choose an appropriate level of skepticism (Glover & Prawitt, 2014) to match risk, they can only do so by utilizing more, or more advanced, Skills, because Traits are considered fixed, at least in the short-term (Peytcheva, 2014; Rose et al, 2010; Carpenter & Reimers, 2013). An implication of this is that an auditor's capacity to be risk-responsive is potentially Skill-dependent. This premise is consistent with Glover & Prawitt's (2014) alignment of scepticism with more or less evidence evaluation and the notion of 'state scepticism' (Nelson, 2009; Hurtt, 2010; Glover & Prawitt, 2014).

3.5.1 A Nexus of Trait and Skill

The emphasis on a 'state' in this chapter (Hurtt et al, 2013; Harding & Trotman, 2015), distinguishes a position of objectivity from the trait aspect of professional scepticism by virtue of skills being required to change in response to specific risk situations. This is in direct contrast to traits, which are generally more enduring: Less subject to change, and more consistent across many situations. The interrelationships between skills and traits must be acknowledged. On the basis of the descriptions in this chapter, a scepticism trait may be thought of as a foundation which provides parameters for openness to enquiry; which may or may not fall short of the goal of a professionally sceptical state.

Prior research has identified a link between trait and skills, examples of which are described above as 'prompts' (Khan & Harding, 2013; Grenier, 2014) and

'augmentation' (Nelson, 2009; Peecher et al, 2013b). For the purposes of addressing the immediate research problem, a more explicit recognition of the nexus between trait and skill is necessary. Consequently, the notion of augmentation is adopted; and whilst ability to adopt external prompts may be helpful to achieving state scepticism, the relatively greater benefits of internal prompts is emphasised. Where adoption and utilisation of prompts is sufficient to influence manifestation of scepticism, and achieve a state other than an inherent position, any change must be a consequence of learned behaviour, because the alternative explanation is innate behaviour, which would be accommodated within the trait position, and result in no change to state.

On this basis, the capability of an individual to augment his/her given trait to achieve state scepticism is therefore referred to in this research as *scepticism skill*. Further, such skill may be put to use to a greater or lesser degree, and/or in varying combination, as required by different situations.

Consistent with Grenier's (2014) view, which specifically defines the components of professional scepticism as a combination of both evidence scepticism and self-criticism, auditor scepticism skills may be both: Self-critical reflective skills which enable recognition that heightened scepticism is necessary; and technical skills to act upon such self-prompts in gathering and evaluating evidence. Carpenter and Reimers (2013) refer to reflections and assessments as 'sceptical judgments' and to evidence gathering, and other behaviours in response to the judgments, as 'sceptical actions'.

Skills are known to develop, sometimes rapidly (Bandura, 1993), in response to new learning and experiences. This capacity for change differentiates skill development from heuristic bias because it is less subject to anchoring in personal belief systems: For example, an individual's innate (dis)trust of the roadworthiness of an unfamiliar

vehicle is independent of that person's learned driving skills, even though it may influence the ways in which those skills are utilised whilst driving that vehicle for the first time, in order to remain safe. A highly skilled driver will have more tools available than a novice to use in response to threats to safety, and those tools are adaptable to new situations and expressed more readily. This analogy is appropriate to auditing because it illustrates expression of skill in terms of openness to reassessment of, and response to, situations of ambiguity, uncertainty and risk.

In this light, Sceptical Behaviour may change in response to prompts (Noviyanti & Winata, 2015) that initiate more or less scepticism skill to achieve a more or less sceptical temporary state, appropriate to the situation. Prompts to achieve a more sceptical state do not always result in sceptical actions, or behaviour (Khan & Harding, 2013; Harding & Trotman, 2015), but if an individual does take appropriate action (Grenier 2014; Harding & Trotman, 2015) as a consequence of achieving an appropriately sceptical state, such behaviour may be described by the equation: [9]

Situational Scepticism Behaviour = Trait + Skills in Action

$$SitSB = f(T + SkA)$$

To facilitate understanding of the effect of such prompts on behaviours, it is first useful to understand the characteristics of a state in the absence of such prompts. That is, an individual's *default scepticism mindframe*, including the stable trait plus the skills available to the individual, without the influence of specific situational prompts. Understanding of the default mindframe is expected to facilitate comparison with Scepticism Behaviour for the purpose of empirically evaluating the

[9] A multiplicative relationship was considered, but an additive approach was favoured for the purposes of exploring the bilateral scales used for the purpose of this research. The possibility that a multiplicative relationship may reveal further insights, particularly in terms of statistical analysis, is accommodated in the Further Research Opportunities section of Chapter 7.

interplay of prompts and sceptical behaviours. Therefore, the default position is of particular interest to this research, and is represented by the adapted equation:

$$\text{Default Scepticism Mindframe} = \text{Trait} + \text{Skill}$$

$$DSM = f\,(T + Sk)$$

3.5.2 Preferred Scepticism Skills

It is important to recognise that not all skills are of equal value: For example, over-reliance on heuristics, or prominent heuristic biases, can lead to counter-productivity problems, as described earlier in this chapter. To determine preferred skills, we return to the Auditing Standard definition of professional scepticism, which extends the notion of audit risk by drawing focus squarely to evidence.

The Auditing Standards stipulate technical processes involved in exploring for risks of material misstatement (AUASB, 2013c), but the forming of rational assessments of risk remain a matter of judgment (AUASB, 2013c). The understanding obtained from initial risk assessment informs the audit plan and the sufficiency and appropriateness of further evidence to be gathered and analysed (AUASB, 2013c). If analytical skills are not applied appropriately at this stage, the audit plan may not include missed cues, and therefore may not be appropriately responsive to the real risks of misstatement. On that basis, this research is interested in skills that reflect curiosity, as representative of likelihood to conduct more thorough risk explorations.

Also of particular interest to this study are enquiry skills which encompass analysis of evidence, and attitudes toward analysis. As auditors are expected to gather and evaluate more persuasive evidence in circumstances of heightened risk (AUASB, 2013d), a positive relationship is expected between skills involving *consideration of*

evidence and *risk assessment*. On that basis, this research assumes that individuals who are least tolerant of ambiguity are more likely to gather sufficient appropriate evidence, and then utilise that evidence to inform their judgments.

Prior research asserts that scepticism is partly attributable to traits (Hurtt, 2010), and also that overall expression of professional scepticism is situational (Brown-Liburd et al, 2013). It is also acknowledged above that skills may be accommodated into the trait position, but that further expression is flexible and responsive: A person does not cease to have a skill when it is not being expressed (Bandura, 1993). Therefore, it is the base-line of these *further* skills that this research attempts to capture.

3.5.3 Auditor & Fraud Investigator Roles

Demand for fraud expertise is greater than ever (Logan, 2009; Zipkin, 2009; ACFE, 2005a; Simpson, 2004) and it is increasing further (Zipkin, 2009) in response to increasing fraud incidence (Zipkin, 2009) and increasing fraud sophistication (ACFE, 2009; Abernethy, 2005; CRT, 2005; Nigrini & Meuller, 2014).

Auditors are not required to be fraud examiners, or to acquire fraud investigation skills. However, auditors are well-placed, by virtue of their roles and expertise, to identify fraud schemes, which may then be referred to investigators for a fraud examination engagement. Fraud engagements are only initiated after fraud is suspected, and are wholly distinct from external auditors' financial statement assurance engagements. Suspicions of financial statement or other sophisticated frauds can only be raised by those with sufficient expertise and professional scepticism to query the truth and fairness of financial statements and other evidence. Auditors have the greatest relative knowledge to contribute to the field of financial statement fraud detection, and are best placed to fill the demand for detection expertise at the early identification and pre-examination stage.

3.5.4 Fraud Investigators' Professional Scepticism

QFIs are deemed to exemplify professional scepticism for several reasons. Firstly, the nature of their work involves heightened scepticism at all times, rather than only in response to assessed risk. This is because when fraud is already suspected, inherent risk and control risk will always be high, and therefore it is imperative that heightened skills are employed to reduce the risk of failing to detect appropriate cues for the purpose of assessing the risks, formulating hypotheses, and planning procedures to gather relevant evidence. To this extent, a fraud engagement may be considered somewhat similar to a high-risk audit; but the procedures also accommodate the following increased challenges.

For the purpose of planning the investigation, QFIs attempt to identify cues about the expected fraud, but this process frequently involves evidence that is deliberately concealed so that the perpetrator can evade detection. This contrasts with audit for error, wherein the evidence is in plain sight. Although auditors must increase scepticism in response to increased risks, such as fraud cues, QFIs working on a fraud case would need to exercise this heightened scepticism at all times.

In fraud investigations, the nature of cues is potentially more varied and ambiguous, in that anomalies may be disguised as something else. For example, anomalies may show up as omissions in a procedure or transaction trail or pattern, or be hidden in plain sight within false evidence. Evidence is frequently deliberately concealed by perpetrators for the purpose of evading detection. Auditors are not expected to verify the authenticity of evidence; instead utilising evidence from independent third parties, where possible, because it is generally considered more persuasive than client-produced documentation (AUASB, 2013d). As QFIs specialise in the deceptive features of fraud, manifesting as fake transactions, false representations,

and fraudulent documentation, they are deemed, for the purposes of this research, to be more sceptical in terms of evidence analysis.

Further, evidence in fraud cases is often circumstantial, given that one of the defining characteristics of fraud is intent (ACFE, 2007a, p367). Intent is very difficult to prove in the absence of a confession, so therefore the quality of circumstantial evidence (ACFE, 2007a, p.8), and its relationship to 'hard' evidence, must be strong enough to withstand the scrutiny of the courts. All such evidence must be authenticated to satisfy the courts or it can be ruled inadmissible (ACFE, 2007a, p.146; ACFE, 2013), and a chain of evidence (ACFE, 2007a, p.158) must be recorded throughout the investigation and prosecution processes. These complications attest to the thoroughness with which fraud investigators' evidence must be collated and presented.

Finally, the scope of fraud investigators' evidence is somewhat different to that of auditors. Auditors are required to gather sufficient evidence, which is appropriately *persuasive* for the purpose of forming an *opinion* that provides *reasonable* assurance that the accounts are fairly stated, in all *material* respects. The methods of evidence collection, analysis, results and judgments must be documented, which also provides evidence in terms of procedural quality, and it is this documentation which may protect auditors in the event of prosecution. In contrast, fraud investigators are required to gather a broader range of evidence which might include accounting information and procedural documentation, similar to that used by auditors, as well as interview recordings or transcripts, interviewee statements, confessions, and even background and financial information about the income, assets, liabilities and

activities of individuals associated with the case.[10] All such information must be of greater probative value. This means that the evidence contributes to facts (ALRC, 2006) which provide proof (Farlex Inc, 2015; ACFE, 2007a, 2013). Given that persuasiveness and reasonable assurance do not constitute proof, auditors' responsibility is not as onerous in terms of evidence collection.

Overall, QFIs are expected to have greater evidence-related scepticism skills. Therefore, QFIs are used to set the benchmark of professional scepticism.

3.6 The Professional Scepticism Model

The primary objective of this study is to identify a professional level of scepticism, enable separate measurement of individuals' traits and skills, and identify whether the overall individuals' scepticism scores (net of counter-effects) fall within the professionally sceptical range. The term Enquiry is used to incorporate the concept of enquiry skills into the research model. This section combines Enquiry with the Trait and Skill concepts described above, to collate a composite model of professional scepticism.

The model in Figure 3.8 depicts Scepticism as a combination of Trait and Skill factors. The X axis represents the continuum of traits, which extend from the extreme of Belief to the opposite extreme of Cynicism. A point of professional scepticism is identified in the centre, which represents a neutral position, unfettered by bias in either direction.

---

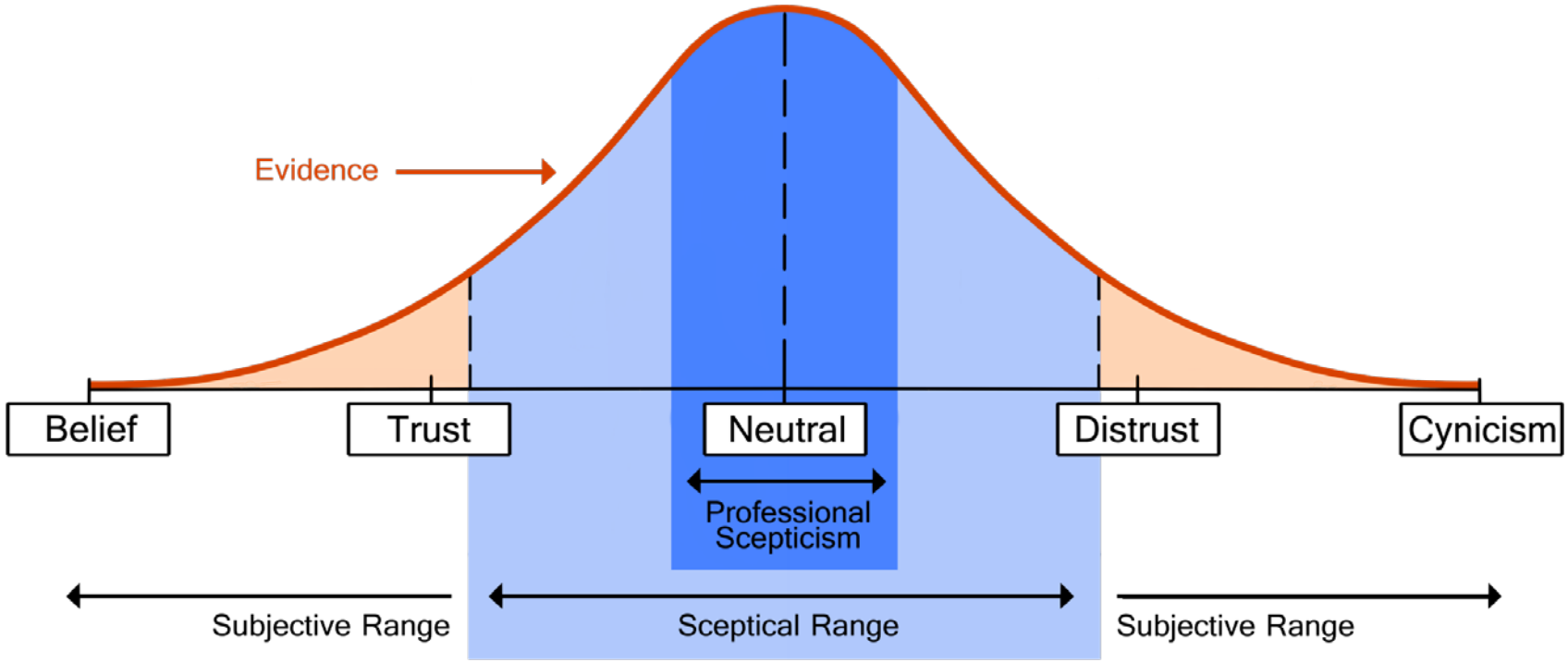
[10] More information about evidence requirements for the purpose of investigating and prosecuting fraud is freely available on the Association of Certified Fraud Examiners' resources website at http://www.acfe.com/search.aspx?SearchText=evidence&Section=939, last accessed 27/7/16.

The Y axis represents skill in terms of enquiry. Due to the association between evidence and enquiry, made in section 2.4, this research proposes that graphic depiction of the use of enquiry skills may be expected to follow a similar curve to the curve depicting the sufficiency and appropriateness of evidence utilised in the forming of judgements or opinions, in Figure 3.3, above, with the most neutral (professionally sceptical) individuals making the greatest use of enquiry skills. Complete neutrality would involve high quality enquiry to high quality evidence, and allowing that evidence to determine fact on its own merit. In each of the opposite extremes, zero evidence is analysed.

However, it has also been noted that skills may augment or counteract an inherent trait position, so a possibility must be acknowledged that the enquiry curve could skew for certain individuals or groups of individuals, perhaps aligning with, counteracting or augmenting, their trait positions.

From the discussion in this chapter, summarised in the research model, a number of hypotheses are derived. These hypotheses are designed to test the veracity of the model in addition to exploring for answers to the research questions.

Figure 3.8 A Composite Model of Professional Scepticism



3.7 Hypotheses

To explore whether auditors exhibit a professional level of scepticism, the following research questions were posed:

RQ 1: Do auditors and other groups exhibit different levels of scepticism?
and
RQ 2: Do auditors exhibit professional scepticism?

In order to explore for, and differentiate, a professional level of scepticism from lay scepticism, (dis)trust and extreme-(dis)trust levels, it is necessary to consider traits and skills that encompass a wider range of the continuum than would be represented by auditors alone. Consequently, in addition to researching auditors, this study involves capturing data from a broader range of participants, whose scores may be compared with those of auditors.

Two groups of non-audit participants are of particular interest for this purpose: Those who can reasonably be expected to demonstrate very high levels of objectivity in evidence analysis (extremely sceptical states); and those who are not generally required to demonstrate a professional level of scepticism (Laypersons). The first group is to consist of qualified fraud investigators (QFIs), whose collation and assessment of evidence must be of the highest standard for admissibility in court if a case proceeds to prosecution, and who are therefore assumed to possess particularly well developed enquiry skills.

Another group is to consist of general members of the public (Laypersons), who may exhibit degrees of scepticism anywhere on the continuum. This group may include evidence experts such as legal personnel, but is generally expected to include

participants who do not necessarily incur the specific professional obligations attributed to members of the QFI and auditor groups. Analyses revealed differences between these (non-audit) professionals and other members of the Layperson group, and the group was subsequently subdivided into Sophisticated (professionals) and Non-sophisticated (other) groups.

The survey data will be explored to test reasonableness of the continuum concept, the proposed relationship between trait and skill factors, levels of scepticism, and establishment of a professional level of scepticism. Hypotheses which guide this procedure are described in the following section, and are expressed in a more statistical manner in chapter 4: Method.

3.7.1 Trait Range Hypotheses

The range hypotheses address RQ 1 by establishing the presence of a variable Trait factor as set out in the Professional Scepticism Model at Figure 3.9, above.

Hypothesis 1: Auditors are less trusting than other groups

To explore for whether the Auditor group has, in general, a more neutral default Trait position than other participants, the mean Auditor group Trait scores are compared with all other participants' Trait scores.

If there are differences, the directions of bias (trust or distrust) will be explored. The means of all the separate groups' scores will be compared to test whether there are any significant differences in default Trait biases, and if any of the group means are situated near the Neutral point of the continuum.

Given that trust and belief are more socially desirable traits than distrust and cynicism, the mean of Layperson bias scores is expected to skew, to some extent, toward the belief side of the continuum. Whilst QFIs' work is evidence-based, it is predicated on the assumption that something is amiss, and therefore QFIs are expected to embed, over time, a small habitual bias toward distrust. This expectation also encompasses a possible vocational selection aspect in that those who are highly trusting may not seek a career in fraud prevention and detection.

Hypothesis 2 – Auditors have a more consistent Range of Biases than other groups

The distribution of Trait scores is relevant to establish the instrument's capacity to capture the ranges of Traits across the continuum, within groups, to the extent allowed by the inherent positions of the study's participant samples. The groups' standard deviations will be used to explore for consistency of characteristics within-groups.

It is expected that Auditors exhibit more consistent Traits than other participants. Auditors are *required* to exhibit scepticism (AUASB, 2013b), which entails suspension of judgment and allowing evidence to speak for itself, and if this is reflected as a default Trait, it is expected that the range of Trait scores will be reasonably constrained in comparison to other participants' scores. In contrast, Non-sophisticated Laypersons are expected to exhibit a broad range of biases across the belief/cynicism continuum, reflective of a broad range of natural, social, educational and other environmental influences. Further, whilst QFIs are expected to exhibit a small distrust bias, as described above, some members of that group may also fall within the Neutral range by virtue of their evidence-based vocation, and together these approaches are expected to reflect a broader Trait range when compared with Auditors.

3.7.2 Skill Hypothesis

This research proposes that Auditors utilise Skills when exercising professional scepticism, which serve to decrease ambiguity and increase confidence in judgments.

Hypothesis 3: Auditors are more Skilled than Laypersons, but less skilled than QFIs

If the Skill sub-scale is an indicator of scepticism skill, it is predicted that Auditors' Skill scores will be higher than those of Non-sophisticated Laypersons, who are, in general, not required to obtain or utilise professional skills of this nature.

However, it is also expected that Auditors' Skill scores will be lower, on average, than QFIs'. As described in section 2.5, QFIs' work involves evidence that must be of a standard that is admissible in court, or there can be no prosecution. As the standard of admissible evidence in criminal cases is very high, QFIs are expected to exhibit the highest level of skill.

3.7.3 Scepticism Level Hypotheses

The Scepticism hypotheses are framed in accordance with a composite scoring system. First, to facilitate comparison, the raw bias score is reversed so to arrive at a unidirectional score expressed as a positive number. This number indicates a level of bias, but not a direction of bias. The skill and trait aspects of scepticism are then combined to produce an overall measure of scepticism between 0 and 100. The composite score assigned to the highest level of overall scepticism is 100, representing judgments based on evidence deemed reliable and evaluated without material bias.

The hypotheses in this section begin with exploration for diversity in overall scepticism scores as a precursor for establishment of discrete scepticism levels.

Hypothesis 4: Auditors have a more consistent range of Scepticism than other groups

In the first instance, the standard deviation of the QFI group's Scepticism scores is compared with the standard deviation of Non-Sophisticated Laypersons' scores to test whether there are observable differences in the ranges of Scepticism scores. It is expected that the null hypothesis will be rejected because QFI group's standard deviation will be smaller, due to a degree of professional homogeneity that is not necessarily shared by Non-sophisticated Laypersons. If this is the case, the concept of groupings will be validated, and tests comparing results between groups will be more meaningful.

Alternate hypotheses will seek to establish whether Auditor scores are also significantly more consistent than those of Non-Sophisticated Laypersons, as is expected by virtue of their professions. A third alternate hypothesis will test whether the range of QFI Scepticism clusters more effectively than that of Auditor Scepticism, and finally, Sophisticated Layperson Scepticism is compared with Non-sophisticated Layperson Scepticism.

Hypothesis 5: Auditors' Scepticism level is higher than Laypersons', but lower than QFIs'

In the first instance, the means of the Sophisticated Layperson group's Scepticism scores is compared with the means of Non-Sophisticated Laypersons' scores to test whether there are observable differences. It is expected that Sophisticated

Laypersons' mean score will be higher, reflecting greater scepticism than exhibited by Non-sophisticated Laypersons.

The next alternate hypothesis will seek to establish whether Auditor Scepticism scores are significantly greater than those of Sophisticated Laypersons, as is expected by virtue of their profession. And finally, the third alternate hypothesis tests whether mean QFI Scepticism is greater than mean Auditor Scepticism.

If the null hypothesis is rejected, a professional level of scepticism will be established that reflects QFI skills, with which the Auditor scores will be compared by testing the final Hypothesis, below.

3.7.4 Professional Scepticism Hypothesis

This final hypothesis extends the results of hypotheses 4 and 5 above. If the nulls of those hypotheses are rejected, the notion of scepticism levels is supported. A lower boundary of a professional level of scepticism will subsequently be set at a point on the composite Scepticism scale which represents two standard deviations of the mean QFI score from its uppermost end, thereby establishing a range to accommodate the majority of professionally sceptical attitudes. This calculation is dependent on figures extracted from the survey data, so the procedure, and the rationale behind it, is explained in section 4.6: Data Analysis Methods.

Hypothesis 6: Auditors' Professional Scepticism is equal to, or higher than, the minimum benchmark for Professional Scepticism.

This hypothesis tests whether Auditors' Scepticism scores fall within the 'professional' range of scepticism by observing whether the Auditors' scores are greater than the benchmark established as above.

The proportion of Auditor group scores which meet or exceed the lower boundary represents, for the purpose of this research, the proportion of auditors who are likely to express professional scepticism, even in the absence of external prompts.

3.8 Summary

Scepticism is represented on a continuum for the purpose of enabling transition from prior relative measurement systems, which compare auditors with other auditors, toward a discrete measurement system. The aims are to identify a professional level of scepticism, enable separate measurement of individuals' traits and skills, and identify whether the overall individuals' scepticism scores (net of counter-effects) fall within the professionally sceptical range.

In combination, the X and Y axes of the Scepticism Model represent all variations in individuals' scepticism – at a particular time in their trait and skill development. For example: At the extremities of the continuum, an individual with traits indicating an extreme level of belief or cynicism is expected to utilise no new evidence in the forming of his/her attitude to information, and is expected to form judgements or opinions on the basis of bias alone. Such a person would require a large quantity of high quality new information to override existing biases and possibly influence the pre-formed biases. In contrast, small quantities of low quality information may disproportionately reinforce existing biases.

Another example is that in the intermediate areas of the continuum, an individual with traits indicating a disposition of trust or distrust, is expected to have engaged with some evidence over time, that informs their dispositional beliefs. New information may or may not be sought for new decisions, and new information which

is haphazardly or accidentally discovered may or may not be regarded with an appropriate degree of enquiry skill. The greater the degree of trust or distrust, the more evidence will be required to persuade against existing biases.

The Scepticism Model is used, for the purposes of this research, to explore for *default* levels of scepticism, but it could also represent changes in default position over the long-term, as well as situational scepticism, wherein relevant skills may be activated in response to requirements to heighten scepticism in the short-term. Each of these positions could be plotted on the Model according to individual participants' trait (X axis) and skills (Y axis) at that particular point in time, and in that particular situation.

Chapter 4: Method

4.1: Introduction

International Auditing Standards mandate that all audit team members are expected to exercise a *professional* level of scepticism *throughout* the audit (AUASB, 2013b). To explore this two research questions were posed:

RQ 1: Do auditors and other groups exhibit different levels of scepticism?
and
RQ 2: Do auditors exhibit professional scepticism?

Identifying a professional level of scepticism on a continuum enables the transition from prior relative measurement systems which compare auditors with other auditors, toward a discrete measurement system which allows a comparison between auditor performance and the level of performance mandated by regulation.

In the absence of a discrete measurement system, it is not possible to quantify the level of scepticism mandated by regulation, or the levels of scepticism exhibited by auditors. This exposes a measurement gap between the regulated expectation of a professional level of scepticism and criticism that auditors are not always sufficiently sceptical. That gap persists because auditor scepticism has not yet been measured in terms of whether it can be categorised as 'professional' or not. Consequently, auditors have no scientifically objective means to ex-ante evaluate potential exposure to breach of the mandatory requirement to exercise the professional scepticism, or to identify the specific nature of the exposure for the purpose of applying relevant remedial treatment. Closure of this measurement gap may allow auditors to identify

and respond to a scepticism deficit before a problem arises that necessitates qualitative scepticism measurement by the courts; enabling auditors to mitigate the risk of audit failure due to lack of professional scepticism, and thereby mitigate risk of sanctions for such breaches.

Many previous research instruments were developed specifically for the audit context, utilising vignettes or discrete audit tasks[11], which were intended to replicate auditor behaviours in response to client cases. To address the research question 'Do auditors exhibit indicators of professional scepticism' this is not an appropriate approach, as it is necessary to first establish what the levels of scepticism are in order to identify a benchmark for professional scepticism. The case study approach is generally used to derive relative measures of scepticism, rather than the discrete measures necessary for benchmarking; and given that it is possible that the people who exhibit the highest levels of scepticism may, or may not, be auditors, the measurement instrument must be one which can engage a wide variety of participants for the purpose of establishing levels.

This research extends prior studies that have measured auditor scepticism relative to other auditors, and that psychometrically tested auditor judgement in general, by identifying the 'professional' level of scepticism, and assessing auditors' scepticism according to that benchmark.

The rest of this chapter is organised as follows: Firstly, the research design is introduced, and the methods of data collection and participant recruitment are described. Next, the procedure used to develop the survey instrument is described, along with methods of producing scores for the sub-scales and overall scepticism.

[11] See, for example, Grenier (2014).

Following this, are methods of analysing the data collected by the survey instrument, and explanations of ethical considerations.

4.2: Research Design

The research design in this study adopts a survey approach based on scalable items that generically allow the assessment of default characteristics of scepticism in terms of respondent attitudes to information. The survey also gathered ordinal and nominal data about skills/experiences which may influence development and/or manifestation of those characteristics. A wide variety of potential participants were approached because all people are users of information, and could be expected to have a range of skills in accessing and interpreting information and in their inherent attitude to available information. Data gathered from the general population set the generic parameters for attitudes to information. Data was collected to explore for features in the results that identify patterns in attitude scores within and between sub-groups that exhibit different scepticism levels, and to explore for features that may be unique to the audit profession. Discussion of participants, and their roles in the research, continues in the next section.

4.2.1 Participant Groups

In this study three primary groups were required to be a part of the survey groups. These were qualified fraud examiners, auditors and laypersons. An expectation of the scepticism exhibited by these groups was identified.

As this research involved the measurement of the current level(s) of scepticism utilised to meet regulatory requirements and facilitate identification of fraud, and it was not known what proportion of the audit population could be affected by innate

limitations, or to what degree, this study's survey instrument was delivered to a sample drawn from the general (non-audit) population, from which base-line statistics were collated and compared with samples drawn from audit and fraud expert populations. This was to serve to extend scepticism measurement to three clearly identifiable groups, which can reasonably be expected to exhibit scepticism traits across different points on the scepticism continuum as follows:

Table 4.1 Expected Scepticism Ranges

Sample group	**Expected scepticism ranges**
Qualified Fraud Investigators	Professionally Sceptical
Auditors	Sceptical and/or Professionally Sceptical
General public	Entire continuum

The measurement scale used to identify placement of these groups on the continuum is explained later in this chapter.

The rationale for delivering the survey to these three target groups is as follows:

1. **Qualified Fraud Investigators (QFIs).** This is a professional group, consisting of people who have met preliminary benchmarks of relevant education, workplace experience, and specialist anti-fraud training (ACFE, 2015b). Consequently all members are expected to be at least twenty-three years old. Demographic data was collected to observe for differences correlating to age groups and years of experience.

Qualified Fraud Investigators may be from the disciplines of law, policing, psychology/criminology, information technology, education or accounting/auditing, with interrelated knowledge and skills the purposes of fighting fraud. The Association of Certified Fraud Examiners (2015a) is a globally recognised professional body, with which the author is affiliated, and it a seminal source of reference for this research. However, the inclusive term 'QFI' is used for the purposes of this research to include all who have undertaken formal fraud-specialist education, in recognition of other means of specialist qualification, such as via formal specialist tertiary study.

The objective of QFIs differs from that of auditors in that the QFI approach is based on an assumption that investigation ends in prosecution. This has the effect of raising the quality of evidence obtained, as required to support such action, because both physical and circumstantial evidence must be admissible in courts of law. All evidence must be authenticated to be admissible (ACFE, 2007a, 2013), which means that QFIs must be rigorous in their collection, storage (ACFE, 2007a) and critical assessment of all types of evidence, including tangible evidence, electronic evidence and verbal representations (ACFE, 2007a, 2013). In the absence of evidence which meets the stringent requirements of the courts for prosecution purposes, there is no case. And as QFIs' work involves preparation of cases for prosecution and evaluation of evidence which itself may be fraudulent, this group expected to exhibit the highest level of evidence-based decision making, manifesting as the highest level of scepticism skill.

For the purposes of this research, fraud training must be taken to mean more than a mere awareness of the notion that fraud exists. The awareness must mean a conscious acknowledgement of the essential and common pre-conditions, constructs, characteristics and consequences of fraudulent behaviour. Therefore,

in order to preserve the specialist nature of this group, those with formal training which constitutes only part of a qualification, or with informal training, are excluded from the QFI group.

Membership of this group is identified by responses to Question number 28, at the very end of the questionnaire.

2. **Financial statement auditors**. This group is expected to have specialist knowledge from accounting education, workplace experience and mentoring. As all members of audit teams are required to exhibit a 'professional' level of scepticism in the conduct of audits (AUASB, 2013b), this group should include all accountants who perform some role in the external audit function; from undergraduate/assistant accountant through to engagement partner, to reflect normal audit workplace arrangements. Identification of qualification levels and roles enabled analysis of correlation between these and other variables.

   Participants in this group are expected to have experienced varying amounts of education and training in accounting, audit and related matters, but not necessarily to have undertaken specialist fraud training. Graduate accountants have introductory awareness of fraud by virtue of their tertiary auditing course, but specific fraud education is not a requirement of accredited accounting courses in Australia. To control for the possibility that fraud training may be offered within accounting degrees elsewhere in the world, or taken as an elective or further stand-alone study, participants were asked to identify whether they had undertaken any informal training (e.g.: workplace development) or formal education, and if so, whether that was part of a qualification or the primary focus of the qualification. In the first instance, data was collected from accountants

who specialise in audit, as well as accountants who perform other accounting functions. As both experience the same tertiary and professional education, differences were expected to arise due to workplace experiences and specialist training. Participants who indicated they had undertaken formal fraud education that was the primary focus of a qualification were deemed to have exceed the information exposure expected for a qualified auditor (who does not specifically specialise in fraud), and were therefore reallocated to the QFI group.

It may be that only those accountants most capable of scepticism are attracted to auditing work; but data suggesting otherwise may present an opportunity for important future research.

3. **Laypersons**. For the purposes of this research, the term 'laypersons' included all participants who are not QFIs or external auditors. This group was not expected to have any specialist knowledge, education or experience in the fields of accounting generally, auditing in particular, or fraud. However, general public lay-persons are users of a great diversity of information, including information about money, and numerous contexts of risk. On a daily basis, they may evaluate and form opinions about information they encounter, and to determine what constitutes fact.

   This group is expected to include a diversity of participants, such that it includes non-accountant users of financial statements, in both personal and business contexts, as well as trained accountants who have never worked in audit. To explore for any relevant differences between members of this group, descriptive questions are included to discover respondents identifiable as sophisticated lay-

users by virtue of an employment role such as CEO, CFO, or company director, as well as a question regarding accounting training.

4.2.2 Sample Selection

The research is conducted in the English language, and promoted only in English. Although promoted world-wide, it is reasonably expected that only those who were willing and able to communicate in the English language would self-select to participate.

All participants must be a minimum of 18 years old for two reasons. Firstly, in Australia this is the legal age of competence to enter into financial agreements, so it is deemed to represent the minimum age that potential participants assess information for the purpose of financial decision making. The age of legal competence is also deemed the minimum age that potential participants in all countries can assess the research invitation and Participant Information Sheet and provide informed consent to engage in the research. Secondly, in Australia, university students will usually be, or turn, 18 years old during their first year of study. It is therefore also the minimum age that undergraduate assistant accountants will join an accounting firm, and possibly its audit team. Participants were advised of the age restriction in the Participant Information Sheet, and an age demographic question was included in the survey to identify any participants whose data should be excluded.

Other standard demographic data was collected to observe for other differences, including those correlating to gender, education and years of experience.

For each of the groups, a minimum of 30 respondents was required, being the minimum for reasonable exploration of the characteristics within and between groups

(Bouma & Ling, 2004). The total number of respondents required for the main study was therefore a minimum of 90.

It was expected that classification of participants into the required groups may require judgment in some instances. For example, a sophisticated layperson CEO or CFO may have been involved in a fraud examination by virtue of their role, without having undertaken specialist fraud education or a professional accounting qualification. Therefore, the survey remained open to collect more than the minimum number of participants for each group, in case some participants had to be reallocated or excluded. The full set of data was downloaded from the Survey Monkey server on Monday, 17th March 2014, being forty three days after the 3rd February survey launch.

4.3: Data collection

To maximise the number of participants recruited during the data collection period, invitations[12] to representatives of all three target groups were released via social media in the first instance, in anticipation of a snowball effect (Westermann et al 2014), leveraging differences in user networks to increase diversity in the desired cluster samples. It was anticipated that invitations via social media would snowball to reach a broad range of respondents, with varying experiences and perceptions, which is very important for differentiating general norms from expert attitudes, and which is of fundamental importance to this study. Most of the people recruited in this way were categorised, according to their demographic data, as belonging to the Layperson group.

[12] The brief social media invitations directed potential participants to the long-form Invitation and Participant Information Sheet hosted on a purpose-made website. Both forms are included in Appendix 3.

To ensure the minimum numbers of QFI and Auditor participants were recruited, a modified strata/cluster sample approach was then adopted to supplement numbers in these two groups. This entailed issuing of blanket invitations to relevant ACFE discussion boards and LinkedIn professional groups, allowing members to self-select. In addition, individual invitations were sent to members of those groups, being those members who enabled direct contact from within basic membership list searches.

All group 1 (QFI) and group 2 (auditors) participants were invited to forward the invitation to their own contacts, to leverage this convenience sampling approach with further snowball opportunities. In this way, a greater diversity of data was collected given the international nature of online networking fora and that such networks commonly also include contacts in peripheral and even unrelated fields.

This process is further explained in the following section.

4.4: Participant Recruitment Method.

The pilot and main-study questionnaires were both administered online, utilising Survey Monkey, an online survey data collection tool. The survey was delivered electronically in order to:

- Minimise completion time to less than three 6-minute chargeable units of auditor time; as means of increasing the Auditor Group response rate;
- Make use of skip logic to further relieve perceived time burden on users for whom certain questions are not relevant;
- Reach a very broad cross section of people to increase diversity in the General Public group; and

- Improve participation numbers by enabling potential respondents to start and complete the survey at a time and place of their choosing and convenience.

In addition to the time savings and distribution ease described above, social media was the preferred method of participant recruitment due to its capacity to:

- Increase the possible number of participants as compared with personal invitation/email alone;
- Facilitate reaching of a larger number and diversity of people in the General Public group than the author could personally invite; and
- Reduce bias in participant selection (invitation) by releasing the survey in a variety of interest group areas and allowing it to spread through friend/contact networks. As people in networks do not tend to have wholly identical interests, it was expected that 'likes' and 'shares' would distribute the survey exposure to interest groups and networks well beyond the limits of my personal imagination and reach.

An important challenge with this approach was ensuring that all potential participants would be provided with all the relevant information about the research that would qualify their consent as 'informed', and therefore meet the requirements of the project's ethical clearance. As the largest possible number of data sets was considered most desirable, a degree of self-momentum in distribution was to be encouraged and facilitated, whilst ensuring that the survey itself was not separated from the supporting explanatory information that would necessarily be attached to enable informed consent.

To facilitate appropriate dissemination of Participant Information and track the progress of recruitment through the data collection period, a blog site was established

at www.kerriodonnell.wordpress.com to host the study's background material, ethical clearance information, contact details and a hyperlink to the survey. Centralised hosting enabled promotion via a brief overview form of initial invitation, which was deemed more suited to the social media environment, without loss of due process. The survey instrument was hosted by Survey Monkey at https://www.surveymonkey.com/s/BKB58JZ.

Invitations launched via LinkedIn and ResearchGate were published using the author's personal identity, but a temporary Facebook identity (*What do you Think?* at https://www.facebook.com/whatdoyouthinkresearch) was created to launch the invitation on that platform, to maintain consistency with the blog host site title and present the research project with topic-specific formality. The Facebook page also replicated the background and Participant Information material published on the blog host page, to improve the appeal of the page and to encourage potential participants to click through to the survey.

Functionality within the Facebook platform provided all viewers with the opportunity to also 'like' the post, or the host page, which would distribute the post to all the follower contacts of that viewer, further distributing the survey invitation to a wider audience. To facilitate the snowball effect further, an overt request to forward-promote was included in all invitations, and the host blog site also included buttons to allow visitors to easily forward-promote the site to their own networks via Facebook, LinkedIn and Twitter.

The title of the host blog site appears to have attracted some respondents, in itself, because the Wordpress blog statistics reveal that some users landed on the site as a result of browser searches for similar titles or surveys in general, distinctly identified

from those who clicked through from one of the launch platforms. Nonetheless, during the data collection period, the study was actively promoted as follows:

The invitation was distributed by private message to all the author's email and LinkedIn contacts, and posted to a variety of public and approved-member LinkedIn groups, encompassing potential participants for all three prospective participant groups. It was also released to a similarly broad-spectrum research community via ResearchGate.

Limitations are noted for use of social media in the conduct of formal research. Most notably, the snowball approach was only representative of social media users connecting with the snowball network-range, within the data collection period, rather than representative of the global adult population. However, the snowball method of obtaining cluster samples is considered appropriate to this exploratory research because it mitigates researcher bias in selection of the general public group.

Nonetheless, it must be acknowledged that self-selection bias remains a potential influence on the results of this research. That is, those of a particular personality orientation, or affected by relevant similar educational or social influences, may take part and thereby dominate each of the sub-samples. The sizes of the QFI, Auditor and SL sub-groups are not large enough for meaningful analysis of global representativeness, so this presents an opportunity for future research with a much larger data set. However, during the data analysis phase of this research, in section 4.6, below, each of the sub-sample groups are compared and the results explored. The results indicated differences which generally suggest that each of the groups appropriately represent the target population for the purposes of this exploratory study.

To specifically capture members of each of the three groups, further promotion was undertaken as follows.

Group 1 – QFIs

Public-access Facebook pages were identified using the search term "fraud", prioritising professional groups with large memberships and which allowed posts to the timelines.

In addition, the Association of Certified Fraud Investigators (ACFE), which boasts a global membership of more than 75,000 members (ACFE, 2015a), maintains various discussion fora on its website at www.acfe.com to which this researcher has access. Invitations were posted to these fora to attract both certified (qualified) and associate members to participate, though entry dates suggested that day-to-day traffic on these fora was not high during the data collection period.

The main ACFE LinkedIn group also enabled personal contact between members via private messaging within the platform. The invitation was therefore sent to 121 members, including those flagged as 'top contributors' and others who were not identified by the platform as first or second level contacts, and therefore likely to have already seen the invitation.

Group 2 – Auditors

Public-access Facebook community groups were identified using the search terms "audit", and "auditing", again prioritising those groups with large memberships and which allowed posts to the timelines.

Facebook posts to fraud- and audit-related pages quickly redistributed from target readerships to General Public audiences though, as observable by interim Survey

Monkey reports that showed a large majority of survey respondents reported no training in accounting or fraud, and no experience in an audit team.

Consequently, as above, 106 private messages were sent to members of Accounting & Audit LinkedIn groups.

Group 3 - Laypersons

For the purpose of increasing diversity, further Facebook posts were published. The search term "small business" was used first, to return results deemed representative of general public users of financial and other accounting information. The "education" search term was chosen to reveal laypersons who may be more likely to support an educational research project by participating and forward-promoting; and other search terms were chosen simply to increase diversity due to dissimilarity with other search terms; or randomly, by entering a couple of letters into the Facebook search box and selecting terms that appeared.

To broaden the range of the network to the widest possible demographic spread within the data collection window, these posts to a variety of popular pages representing a variety of interest (rather than geographic) communities, encouraged diversity in socioeconomic and educational status as well as social, cultural and spiritual belief systems.

For this group, priority was given not to professional groups, but to any with large memberships and which allowed timeline posts.

An Invitation to Participate is included at Appendix 3, and a Participant Information Sheet is included at Appendix 4.

4.5 Survey Instrument Development

The survey intends to measure a each respondent's scepticism. Previous attempts to measure professional scepticism do not accommodate the conceptual differences between trust and distrust, which are both barriers to scepticism, but with opposing attitudes. Nor do they accommodate the effects of skills that may influence how scepticism traits manifest. Therefore, a new scale was developed to match the context of the research questions for this study. This study is unique in seeking to compare levels of auditor scepticism with laypersons and a QFI benchmark.

The need to involve a psychometric instrument to measure respondents' scepticism presented a challenge to this research in that the researcher did not have access to the most well established psychometric tools, which are restricted to use by registered psychologists. Consequently, the specific components of this research are measured via publicly accessible instruments which best matched the research constructs. Three instruments that fit this purpose were identified, each of which has been tested and reviewed in prior research, and described below. The three are: Budner's Intolerance of Ambiguity scale (1962), The Wrightsman Interpersonal Trust scale (1991); and The Curiosity and Exploration Inventory-II by Kashdan et al (2009).

Importantly, the survey questions do not reflect an audit-specific workplace context, so that non-auditors were able to answer the exact same content questions, and with the double benefit of mitigating any audit workplace-specific heuristic bias. Responses to the personality questions and skill questions should enable identification, at the time of taking the survey, of:

- Inherent scepticism levels (bias position);
- Learned scepticism skill levels;
- Overall default levels of scepticism; and

- Comparison of these overall levels of scepticism against the mandatory level required by regulation.

4.5.1 Survey Structure

Separate measurement of the trait and skill aspects of scepticism should provide for a more comprehensive understanding of how *skills* aspects function, as distinct from the previously explored *personality* aspects, allowing for exploration for any apparent limitations to, or facilitators of, skill development. These developments contribute to more comprehensive consideration of variables, enabling more sophisticated discussion about the hypotheses.

The questionnaire was structured so that questions were grouped into three sections: Demographic, scepticism content, and supplementary background data. Basic demographic questions were administered first. The intention of using this structure was to:

- allow respondents to become engaged in the instrument by answering simple and reasonably non-sensitive questions about their gender, age, education and employment, before moving on to the more personal questions about attitudes;
- start with general questions that did not define a subject matter, but allowed respondents to focus upon themselves, and establish a norm of selecting genuine rather than perceived 'best' answer choices; and
- gather all the simple, but essential, data at the very beginning, so that if respondents started to feel burdened by the attitude questions, they would know from experience that not all pages contained complex questions, and see by the progress bar on the current page screen that they had substantially completed the survey. Therefore they may be less likely to quit.

All variables from this section are associated with the study's hypotheses, such as identification of auditing group members, and/or were gathered to compare with the findings of prior studies.

The second section addresses the most important points of the research; requiring participants to reflect upon how they think. Scores derived from the three sub-tests in this section were combined to produce each respondent's scepticism score. The three elements within this section are adapted from prior research:

a) **The Wrightsman (1991) Interpersonal Trust scale** is a seminal scale that has been utilised in prior research of auditor scepticism (such as Rose et al, 2010) to measure participants' inherent levels of trust toward others. In this study it is used to measure participants' inherent levels of trust, in general, at the time of completing the survey, which indicated both the level and direction of inherent bias.

b) **Budner's (1962) Intolerance of Ambiguity scale** was chosen by virtue of its simplicity, appropriateness to a broad community cross-section, and its sustained use in the behavioural decision making literature. Specifically, intolerance of ambiguity (high uncertainty avoidance) is associated with professional scepticism (Cohen et al, 1993; Hughes et al, 2009; Hurtt et al, 2013; Grenier et al, 2015).

   Intolerance of ambiguity relates to desire for evidence and to managing the risks arising from uncertainty. Whilst such intolerance may be categorised as a personality trait in the general context, its particular relationship to the role of evidence suggests that this instrument may be well suited to measure the extent to which further information is gathered.

   Very low levels of intolerance (high tolerance) of ambiguity are expected to have little or no influence on overall scepticism scores, because such persons would

not be motivated to enact evidence gathering skills to resolve the ambiguity. In contrast, very high levels of intolerance (low tolerance) of ambiguity, is expected to initiate desire for further information, manifesting as gathering of evidence, which involves conscious action and information-sourcing skill to determine which evidence should be gathered. This directly reflects auditors' obligation to make sceptical judgments on the basis of evidence, and represents the first variable skill in this study's overall professional scepticism measure.

c) **The Curiosity and Exploration Inventory-II by Kashdan et al (2009)** was included to explore for its potential to measure how people think about the information they have gathered. On the basis that a curious person would not merely gather evidence and then merely accept it at face value, as a checklist item, it is expected that those with high Curiosity and Exploration scores would be more likely to critically analyse the information they gather. This directly reflects auditors' obligation to critically assess audit evidence, and represents the second variable skill in this study's overall professional scepticism measure.

Finally, in the third section of the instrument, background data is collected. Some of this is for the purpose of identifying Group 1 participants, for example. In this section, participants are also asked to self-rate their scepticism, to explore how well auditor respondents are able to self-reflect. This is the only time that the term 'scepticism' is mentioned in the survey; partly to elicit more natural responses from informed respondents, and partly to mitigate confusion in lay-respondents who may interpret the term differently to the audit context, and frame their responses toward an unnecessarily pronounced trust bias.

At the end of the survey there was a disclosure that explains that lay terminology was employed for the purpose of the survey because the term 'scepticism' can be

interpreted in very different ways, which could lead participants toward answer choices that don't genuinely reflect their views.

This questionnaire was pilot tested for user-friendliness and potential to capture data across the continuum, and the main study data was further tested, as described in the following sections. A complete list of all the questions initially presented to participants is included at Appendix 5, and the list of questions ultimately utilised for the purpose of measuring scepticism are presented in section 4.6 The Professional Scepticism Scale Question Set, below.

4.5.2 Pilot Testing

Before administration to the main study participants, the survey instrument was pilot tested to gather feedback about user-friendliness and establish whether the instrument could capture a diversity of scores across the proposed scoring continuum.

The pilot group consisted of Laypersons with some understanding of financial reporting. These participants were undergraduate and postgraduate coursework students enrolled in an Accounting major at the study's host university. This group was expected to have basic knowledge, education, and possibly practical experience in the field of accounting and auditing, but no specialist knowledge of fraud. Students in their first or second year of education were deemed to represent that section of the general public which is expected to be least sceptical if training and workplace experience are facilitators of scepticism.

To enable basic exploratory analysis, a minimum of 30 pilot respondents (Bouma & Ling, 2004) were sought. The primary purposes of this test were threefold: To seek

feedback on the user friendliness of the online survey, and whether any technical logic errors threatened its capacity to capture all the required data. Finally, the data was examined to observe for means of refining the instrument prior to the main data collection.

The pilot cohort of students was invited to participate via bulk email distributed on my behalf by the University of Tasmania's Division of the Deputy Vice-Chancellor (Students & Education). Therefore it can be reliably assumed that the invitations were successfully delivered. However, the *timing* of invitations, five days after the release of examination results, meant that student exposure to the invitation was severely reduced, resulting in a very poor response rate. Of 31 commencing participants, five did not complete the survey. The five incomplete data sets were deemed to be withdrawals of consent, so all data from these participants was withdrawn from the study. This resulted in 26 usable data sets, which were used to gather feedback about survey usability and to observe whether the data being collected was potentially useful for testing the hypotheses.

Feedback

The pilot instrument contained an extra free text field at the end, inviting participants to provide feedback or general comments. Data sets were first examined for entries in that field which could reveal errors, inconsistencies or user-unfriendliness that had not been identified earlier. The only problem identified at this stage was in fact a major one: The 5-point Likert scale headings in question 18 contained an error in that both ends of the scale contained 'likely' options. This was reported by three respondents, but fortunately only affected the response choice of one respondent, whose selection was adjusted to reflect the option indicated in the feedback. This error was reported, and corrected, on the first day of the week-long pilot period.

To reduce repetition for users, to improve topic flow, and to facilitate more effective skip-logic, several demographic items in Part A were re-ordered. To reduce perceived burden on participants, a progress bar was added to the bottom of every screen, indicating the percentage complete. This was considered to be particularly important for encouraging participants during the middle sections of the survey, which contained the largest sub-scale question sets. In addition, page headings were hidden from view on the basis that they increased reading without adding value to participants.

Potential

Five items flagged for exclusion from the instrument to substantially improve an initial Cronbach's Alpha of 0.714. However, the very small and homogenous pilot sample was not representative of the larger samples required, so it was ultimately decided to retain the questions in case they presented opportunities afforded by larger and more heterogeneous samples.

4.5.3 Instrument Refinement

The methods utilised to refine the initial exploratory survey instrument to extract those questions which were most useful to measure scepticism, and its component aspects, are described in this section. These tests were conducted using the main study data to capture the fundamentally important influences of QFI and auditor characteristics in addition to the broad-spectrum Layperson characteristics.

No test of inter-rater reliability was conducted, as all data were coded automatically using computerised system set up by a single researcher. All data points flagged by that system for manual coding were reviewed by the same researcher and accommodated by adjustment to the automated system.

Cronbach Alpha scores were used to measure the internal consistency (Allen & Bennett, 2012) of non-demographic test items. Initially, all scale-type items were tested, with poor result. Items flagged by SPSS as being least consistent with unidimensionality (overall scepticism) were eliminated in turn until the maximum possible Alpha for the available scale items was achieved. An eleven item scale emerged from this process, with a Cronbach's Alpha of .943, and scores ranging from a minimum overall score of -26 and maximum possible overall score of +22. Whilst this suggested an instrument and scoring system that would accommodate the continuum concept, it was noted that two distinct distribution curves were observable for Layperson participants. This prompted further exploration of groupings.

Consequently, the Laypersons group was further divided into sophisticated and non-sophisticated sub-groups, with the sophisticated category including those respondents who reported accounting training, experience of a fraud event, or informal fraud training. The above test was repeated using the following participant categories: a) all participants (n = 291); b) sophisticated participants (groups 1, 2 and 3, n = 138); and c) non-sophisticated participants (group 4, n = 153), to observe for patterns.

When multiple options were suggested by SPSS for elimination to improve the Alpha, items that did not appear in the first-extracted scale, above, were eliminated first.

Descriptive statistics for each of the resulting 17-item Scepticism Scale instrument questions are shown in the following table:

Table 4.2 17-item Inventory - Descriptive Statistics

Qn #	Question Text	Theoretical Score Range	Actual Range	Mean	Mode	Standard Deviation
1	If you give the average person a job to do, and leave them to do it, they will finish it successfully.	-2 : +2	-2 : +2	1	0	0.97
2	People claim that they have ethical standards regarding honesty and morality, but few people stick to them under pressure. (R)	-2 : +2	-2 : +2	0	-1	**1.37**
3	People usually tell the truth, even when they know that they would be better off lying.	-2 : +2	-2 : +2	0	-1	1.25
4	Nowadays people commit a lot of crimes and do bad deeds that go unnoticed. (R)	-2 : +2	-2 : +2	0	-1	1.28
5	Most students do not cheat when taking an exam.	-2 : +2	-2 : +2	1	1	1.03
6	Most people would tell a lie if they could gain by it. (R)	-2 : +2	-2 : +2	0	1	1.27
7	Most people are basically honest.	-2 : +2	-2 : +2	1	1	0.90
8	If you act in good faith with people, almost all of them will be fair to you.	-2 : +2	-2 : +2	1	1	0.98
9	Most people lead clean, decent lives.	-2 : +2	-2 : +2	1	1	0.96
10	Most people are not really honest for a desirable reason; they're afraid of getting caught. (R)	-2 : +2	-2 : +2	0	1	1.17
11	In the long run, it is possible to get more done by tackling small, simple problems rather than large and complicated ones.	0 : 4	0 : 4	2	3	0.98
12	Do you question the way you approach thinking about important decisions?	0 : 4	0 : 4	2	2	1.26
13	If most people could get into a movie without paying and be sure that they were not seen, they would do it. (R)	-2 : +2	-2 : +2	0	0	0.98
14	If you want people to do a job right, you should explain things in great detail and supervise them closely. (R)	-2 : +2	-2 : +2	0	0	**0.88**
15	Most people would cheat on their income tax if they had a chance. (R)	-2 : +2	-2 : +2	-1	-1	0.9
16	An expert who doesn't come up with a definite answer probably doesn't know much.	0 : 4	0 : 4	2	2	0.83
17	The sooner we all acquire similar values and ideals the better.	0 : 4	0 : 4	2	1	1.01

The (R) notation signifies items which are reverse-scored.

Table 4.2 indicates a diversity of responses to all questions when the results are viewed in aggregate. It indicates that the most consistent responses, overall, were to question 16, and the least consistent responses were to question 2.

For completeness, the same data were examined per group, and those results are presented in Appendix 6. Whilst the grouped tables enable observations of differing score ranges and item scores between groups, these results do not, in isolation, encompass sufficient explanatory power to enable the making of meaningful conclusions about such differences. However, the instrument refinement undertaken in the remainder of this section indicates a useful scale when items are viewed collectively, rather than individually, and therefore more meaningful observations are expected from exploration of the score statistics across the full scale.

In the meantime, the data were explored for statistical relationships between items, and those relationships are presented in the following table:

Table 4.3 17-item Inventory – Correlation Matrix

			Item Number															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Kendall's tau_b	1	Correlation Coefficient	1.000	.585**	.683**	.504**	.619**	.475**	.618**	.657**	.736**	.511**	.353**	.470**	.182**	.232**	.052	-.160**	-.251**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.305	.002	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	2	Correlation Coefficient	.585**	1.000	.663**	.607**	.542**	.620**	.688**	.532**	.604**	.729**	.538**	.596**	.337**	.355**	.191**	-.050	-.213**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.329	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	3	Correlation Coefficient	.683**	.663**	1.000	.573**	.640**	.665**	.700**	.681**	.754**	.624**	.381**	.519**	.340**	.310**	.145**	-.045	-.208**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.004	.377	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	4	Correlation Coefficient	.504**	.607**	.573**	1.000	.347**	.503**	.648**	.573**	.488**	.515**	.388**	.457**	.192**	.277**	.041	-.109**	-.285**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.413	.031	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	5	Correlation Coefficient	.619**	.542**	.640**	.347**	1.000	.453**	.513**	.513**	.627**	.576**	.474**	.539**	.221**	.165**	.061	-.161**	-.261**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000	.000	.000	.000	.000	.001	.234	.002	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	6	Correlation Coefficient	.475**	.620**	.665**	.503**	.453**	1.000	.601**	.462**	.573**	.571**	.373**	.394**	.546**	.469**	.346**	.114*	-.034
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.025	.501
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	7	Correlation Coefficient	.618**	.688**	.700**	.648**	.513**	.601**	1.000	.690**	.712**	.576**	.404**	.480**	.272**	.305**	.092	-.059	-.291**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000	.000	.000	.000	.000	.000	.076	.252	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	8	Correlation Coefficient	.657**	.532**	.681**	.573**	.513**	.462**	.690**	1.000	.697**	.438**	.315**	.392**	.152**	.206**	-.010	-.177**	-.350**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.	.000	.000	.000	.000	.002	.000	.845	.001	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	9	Correlation Coefficient	.736**	.604**	.754**	.488**	.627**	.573**	.712**	.697**	1.000	.583**	.370**	.475**	.260**	.273**	.105*	-.084	-.258**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.	.000	.000	.000	.000	.000	.041	.101	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	10	Correlation Coefficient	.511**	.729**	.624**	.515**	.576**	.571**	.576**	.438**	.583**	1.000	.557**	.625**	.364**	.349**	.209**	-.031	-.176**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.	.000	.000	.000	.000	.000	.538	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	11	Correlation Coefficient	.353**	.538**	.381**	.388**	.474**	.373**	.404**	.315**	.370**	.557**	1.000	.494**	.253**	.307**	.146**	-.007	-.112*
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.	.000	.000	.000	.004	.895	.026
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	12	Correlation Coefficient	.470**	.596**	.519**	.457**	.539**	.394**	.480**	.392**	.475**	.625**	.494**	1.000	.225**	.267**	.108*	-.120*	-.187**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.	.000	.000	.030	.017	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	13	Correlation Coefficient	.182**	.337**	.340**	.192**	.221**	.546**	.272**	.152**	.260**	.364**	.253**	.225**	1.000	.467**	.496**	.243**	.165**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.002	.000	.000	.000	.000	.	.000	.000	.000	.001
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	14	Correlation Coefficient	.232**	.355**	.310**	.277**	.165**	.469**	.305**	.206**	.273**	.349**	.307**	.267**	.467**	1.000	.286**	.380**	.198**
		Sig. (2-tailed)	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.	.000	.000	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	15	Correlation Coefficient	.052	.191**	.145**	.041	.061	.346**	.092	-.010	.105*	.209**	.146**	.108*	.496**	.286**	1.000	.248**	.343**
		Sig. (2-tailed)	.305	.000	.004	.413	.234	.000	.076	.845	.041	.000	.004	.030	.000	.000	.	.000	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	16	Correlation Coefficient	-.160**	-.050	-.045	.109*	.161**	.114*	-.059	.177**	-.084	-.031	-.007	.120*	.243**	.380**	.248**	1.000	.579**
		Sig. (2-tailed)	.002	.329	.377	.031	.002	.025	.252	.001	.101	.538	.895	.017	.000	.000	.000	.	.000
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291
	17	Correlation Coefficient	-.251**	-.213**	.208**	.285**	.261**	-.034	.291**	.350**	.258**	.176**	.112*	.187**	.165**	.198**	.343**	.579**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.501	.000	.000	.000	.000	.026	.000	.001	.000	.000	.000	.
		N	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291	291

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

This table indicates significant relationships between the seventeen scale items.

At the end of this procedure, the reduced instrument was subjected to *confirmatory factor analysis* to establish whether the instrument had been refined appropriately. This confirmed that the scale measured the two factors required by the research model, even after reduction of scale items using Chronbach's Alpha.

This study identified two dimensions that contribute to forming professional scepticism: traits and skills. To assess whether this was reflected in the reduced survey instrument, a factor analysis was undertaken in order to ascertain whether two factors appeared in the analysis.

Although a pre-requisite criterion of Factor Analysis is normality, the analysis was applied to the non-normal distribution (Allen & Bennett, 2012) within the Non-sophisticated Layperson cohort because the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, at .914, indicated that the data was suitable for factor analysis (Allen & Bennett, 2012). A number of Pearson correlations were greater than 0.3, and the Bartlett's Test significance was less than 0.05, so factor analysis was explored further (Allen & Bennett, 2012). All MSA values were above 0.7, indicating strong relationships between variables (Allen & Bennett, 2012), however a wide range between high and low communalities values again reflects differences in responses to the skills questions.

Using all participants' data, 60.891% of variances were explained by two underlying factors. Whilst those items identified solely for factor 1 involve strong loadings, particularly for the trait items, many of the factors load onto both factors. A Pattern Matrix, extracted via Principal Axis Factoring, and a Structure Matrix, rotated via Promax with Kaiser Normalisation method, similarly display dual loadings.

Seeking explanation, testing was repeated with data split between sophisticated and non-sophisticated groups. Of particular interest are the effects of non-normal distribution, and perhaps inconsistently biased responses, and/or implications arising from most of the scale items being scored across a +/- range. The results are summarised in the following table.

Table 4.4 Summary of Factor Analyses

Test	**17 Items**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.914
Bartlett's Test significance	.000
Possible deletions indicated by Measures of Sampling Adequacy	None
Communalities	Across the scale, 5 items scored < .5 [13]
Number of Factors	2
Cumulative Percentage of variances explained	60.891

To observe for problems associated with negative scores associated with the bipolar scale items, these were all converted to positive numbers by adding the maximum negative score value (of -2) to all responses for that item. This was considered preferable to squaring the values because it preserved the differences between positive and negative scores. That is, a score of -2 would be differentiated from a score of 2, being four points apart on the bipolar scale and the scepticism continuum. Results were consistent with using the raw item scores.

Items with the lowest communality were qualitatively reviewed, and two further changes made to the instrument.

[13] For the NSL group (n = 153), all items scored > .5. Differences between respondent cohorts present an opportunity for future scale development research, as described in Chapter 7.

1. Item 15m was considered worthy of inclusion on the bases of:

    a) Simplicity of interpretation. The meaning of the questions should be clear to respondents.

    b) Contribution to the trait attitude scale.

2. Item 16b was excluded on the basis of its double-negative wording, and consequent possibility of confusion to participants, and with particular consideration of respondents for whom English was not a primary language.

Reliability and Factor analyses were repeated, and the remaining 17 items resulted in Cronbach's Alpha of .910, which exceeds the generally accepted level of 0.7 (Nunnally & Bernstein, 1994, in Rose et al, 2010, p. 151). Two factors explain 62.638% of the variances. The KMO measure of sampling adequacy is significant at .915, with no items flagged for exclusion by an MSA of less than 0.5.

The scepticism scale derived from the above analyses is presented in the following table.

Table 4.5 Factor Matrix - 17 items

			Factor Allocation	
New Scale Item Number	Original Item Number	Source	Factor 1 – Trait Scepticism	Factor 2 – Scepticism Skill
1	15a	Wrightsman (1991)	.789	
2	15b		.879	
3	15c		.903	
4	15d		.716	
5	15f		.658	
6	15g		.781	
7	15h		.811	
8	15i		.717	
9	15j		.814	
10	15l		.827	
11	16c	(Budner, 1962)	.577	
12	24	Original Item	.729	
13	15e	Wrightsman (1991)		.577
14	15k			.511
15	15m			.590
16	16a	(Budner, 1962)		.593
17	16g			.721

This proposed scale, by virtue of its statistical reliability and definition of two coherent factors, is considered optimally useful to address the research questions posed in this study. The residual cross-over between factors is not entirely unexpected, given the interrelationship and feedback loop between skills and traits identified in Chapter 2. Grenier (2014, p. 15) also noted a "substantial degree of overlap between [his similarly defined] evidence skepticism and self-criticism constructs". The commonalities are therefore not of concern for the purposes of this research.

Factor 1 is dominated by items that relate to the Trait dimension of professional scepticism. They consist mainly of items adapted from the Wrightsman Trust Scale (1991), plus an inward-looking item from the Intolerance of Ambiguity Scale

(Budner, 1962) and an original item which explicitly asks respondents to rate the frequency with which they question their thinking approach. These questions prompt respondents to evaluate on the basis of personal experience, and thus represent underlying attitudes that may manifest along the trait continuum which ranges from positions of trust, through objectivity, to distrust. Factor 1 then, is a measure of *trait* scepticism.

Factor 2 is dominated by items that relate to the Skills dimension of professional scepticism. They consist mainly if items adapted from the Intolerance of Ambiguity Scale (Budner, 1962), plus three items from the Wrightsman Trust Scale (1991), which require participants to evaluate the behaviour of others, and represent attitudes about uncertainty and openness to evidence. Any such evidence may or may not be in conflict with belief biases. Factor 2 then, is a measure of scepticism *skill*.

4.6 The Professional Scepticism Scale Question Set

The questions derived from the initial composite survey instrument, determined to be most useful for measuring scepticism, and subsequently utilised for is study's Professional Scepticism Scale are re-numbered and presented as follows:

1. If you give the average person a job to do, and leave them to do it, they will finish it successfully.
2. People claim that they have ethical standards regarding honesty and morality, but few people stick to them under pressure. (R)
3. People usually tell the truth, even when they know that they would be better off lying.
4. Nowadays people commit a lot of crimes and do bad deeds that go unnoticed. (R)
5. Most students do not cheat when taking an exam.

6. Most people would tell a lie if they could gain by it. (R)
7. Most people are basically honest.
8. If you act in good faith with people, almost all of them will be fair to you.
9. Most people lead clean, decent lives.
10. Most people are not really honest for a desirable reason; they're afraid of getting caught. (R)
11. In the long run, it is possible to get more done by tackling small, simple problems rather than large and complicated ones.
12. Do you question the way you approach thinking about important decisions?
13. If most people could get into a movie without paying and be sure that they were not seen, they would do it. (R)
14. If you want people to do a job right, you should explain things in great detail and supervise them closely. (R)
15. Most people would cheat on their income tax if they had a chance. (R)
16. An expert who doesn't come up with a definite answer probably doesn't know much.
17. The sooner we all acquire similar values and ideals the better.

The (R) notation signifies items which are reverse-scored.

4.7 Scoring Method

All questions require participants to rate their views using 5-point Likert type scale measures. All items, with the exception of question 12, are bilateral and rated according to the following options:

Agree strongly

Agree

Neither agree nor disagree

Disagree

Disagree strongly

For all items, zero scores reflect the point of least bias, or greatest Neutrality, being the point at which evidence is more likely than bias to inform decisions. A score of zero therefore represents scepticism.

Items 1-10 and 13-15

A variant of the original Wrightsman (1991) scoring method was utilised in that the 7-point Likert scale was adapted to a 5-point scale to match the remainder of the instrument, but there were no further changes. This scale is bipolar, or bilateral, ranging from +2 at the Agree Stongly end to -2 at the Disagree Strongly end. Consistent with the original scale, items 2, 4, 6, 10, 13, 14, and 15 are reverse-scored.

Items 11, 16 and 17

Budner's (1962) original scoring method for the Intolerance of Ambiguity Scale was adapted, in that the direction of scoring has been reversed to integrate logically with the Trust scale. This scale is unilateral, and the adapted scores range from 0 at the Agree Stongly end to 4 at the Disagree Strongly end. The purpose of reversal was to ensure that the lowest score matches the 0 midpoint of the Wrightsman Trust Scale. This procedural intersection reflects the conceptual intersection of greatest trait and skill scepticism at the central point of the Professional Scepticism Model in section 3.6 The Professional Scepticism Model.

Item 12

Question 12 is rated according to the following options:

Rarely or never

On occasion

Sometimes

Usually

All the time

The question 12 scale is unilateral, with scores ranging from 4 at the Rarely or Never end to 0 at the All the Time end. Again, the lowest score matches the 0 midpoint of the Wrightsman (1991) Trust Scale.

4.7.1 Research-specific Sub-Scale Scores

For the purposes of exploring the separate Skill and Trait factors in this research, the relevant sub-scale items for each factor are used as separate sub-sets, as distinguished in Table 4.5.

Trait Sub-Scale

Trait scores are calculated by summing Items 1 – 12, and converting the total value's sign to positive value by squaring the variable and then finding the square root. This is because the sub-scale analyses are specifically concerned with the existence of a Trait bias, rather than the detail of any such bias. These raw scores, are then converted to a percentage using the syntax:

Percentage = 1 - (Positive Raw Trait Score/28) * 100

where 28 is the maximum possible range of scores above 0.

After conversion, the highest possible score of 1.0 represents the most neutral Trait position, and thus the greatest propensity for scepticism.

Skill Sub-Scale

Skill scores are calculated by summing Items 13 – 17, and then converting the total value's sign to positive, as above. These raw scores, are then converted to a percentage using the syntax:

Percentage = 1 - (Positive Raw Skill Score/14) * 100

where 14 is the maximum possible range of scores above 0.

After conversion, the highest possible score of 1.0 represents the greatest skepticism Skill.

4.7.2 Formal Scores

Subjects who complete the 17-item Scepticism instrument received two scores: A Bias Score and a Scepticism Score. These scores were intended for different purposes, and were derived from dual-purpose usage of the survey instrument items, as follows.

Bias Indicators

These scores are distinct from Scepticism scores, and are intended solely for the purpose of clarifying the polarity of any scepticism deficiencies identified in overall scepticism scores. That is, whether a bias is of a Trust nature or a Distrust nature. Bias Scores were calculated as the sum of each participant's Wrightsman (1991) Trust Scale item scores (items 1-10 and 13-15), which sit within the possible scoring range of -26 to +26.

Whilst the numeric result is useful for exploring the continuum in this research, it is not necessary to disclose this number to test subjects. Rather, it is the positive or negative sign associated with the total bias score which is potentially useful

feedback, and which should be viewed in conjunction with the overall Scepticism score, below.

For the purposes of this research, the score is used to look for differences, in terms of means (median or rank) as well as dispersion. The sign identifies the polarity, or direction, of bias, and therefore can be useful for deciding upon relevant skill development activities for those whose Scepticism scores do not represent the desired level of scepticism. On the basis that appropriate skills may offset trait deficiencies, insights which enable matching of training to deficiencies may be more effective than generic training. For example, bias scores suggest a high level of trust in others (at the positive sign end) could result in increased audit risk or, conversely, a high level of distrust (at the negative sign end) could result in audit inefficiencies.

Scepticism Scores

Next, each subject's Scepticism Score was calculated as the sum of all item scores. The raw total of all item scores sit within the possible scoring range of -26 to +42 before conversion.

The Raw Score is first converted to a positive value by squaring the variable and then finding the square root. This positive Total is then converted to a percentage using the following Excel syntax:

Percentage = 1 - (Positive Raw Scepticism Score/42) * 100

where 42 is the maximum possible range of scores above 0.

The highest possible scepticism score of 100% represents the highest level of Professional Scepticism, and the lowest possible score of 0% represents the greatest subjectivity.

4.8 Data Analysis Methods

This study involved two main exploratory foci. The investigation firstly addresses the research hypotheses, seeking to assess whether a benchmark, or level, of professional scepticism was identifiable, and whether there were significant differences between groups in terms of scepticism. To that end, descriptive statistics are reported overall, and for each of the groups.

The second focus emerged by virtue of utilising a newly derived scepticism instrument and measurement system. Whilst the method of refining that instrument and establishing its measurement method are explained in section 4.5, above, addressing the research questions also necessitated testing of hypotheses that addressed the establishment of scepticism levels.

The demographic and other supplementary data captured by the initial long-form instrument was also analysed to explore the validity of the sample groupings in light of expected group characteristics and the results of hypothesis testing.

Data analysis was therefore conducted in three stages, as follows:

1. Examination of Trait scores to observe for representativeness across the Continuum as a precursor for establishment of scepticism levels;
2. Descriptive statistics, including Trait, Skill and Scepticism score observations; and
3. Testing of hypotheses.

Prior to testing, the data was examined for eligibility. Acknowledging that the snowball method of collecting cluster samples via social media and a public online survey may allow participants to submit multiple survey attempts, or incomplete

attempts, the raw data was first examined for eligibility. Data submitted by under-aged participants was excluded by sorting and visual examination of the raw data in spreadsheet format. This data was similarly examined for the purpose of deleting incomplete submissions and any duplicates identified by virtue of matching Internet Protocol addresses and descriptive data points.

The methods utilised for the specific analysis stages are explained in the following sub-sections.

4.8.1 Continuum Representation

Given that the research model centres on a continuum of attitudes, the breadth of Trait data was of great importance. Therefore, comparisons of Trait score ranges were conducted, with the shapes of data distributions, and standard deviations of group scores supplementing comparisons of means to verify that a broad enough range of data were captured to enable comparison of group characteristics and establish levels of overall scepticism.

4.8.2 Descriptive Statistics

The raw data were explored to identify characteristics and trends among subjects. These observations were initially made using simple descriptive statistical analysis.

Next, the data were sorted according to demographic data, and examined for usefulness in terms of groupings that reflect the expected relevant (non)expertise characteristics. Descriptive statistics are reported overall, and for each of the groups.

4.8.3 Testing of Hypotheses

The *Statistical Package for Social Scientists* (SPSS) software, version 21, was used first to explore all scale-form data for normality as a prerequisite of t-testing (Allen & Bennett, 2012). Depending on the nature of the data distributions obtained, most of the hypotheses were addressed using parametric t-tests. If the data violated the normality and symmetry assumptions, non-parametric Mann-Whitney U tests or Wilcoxon Signed Ranks tests were utilised to determine whether the null hypotheses could be rejected.

In the following sections, methods of testing the Bias, Skill, Trait, and overall Scepticism hypotheses are specified in turn.

Trait Range Hypotheses

These hypotheses were tested using participants' Wrightsman Trust Scale (1991) scores only. When evaluating the Bias sub-scale test results, although the scale centres around a central point of zero, the hypotheses have been framed in such a way as to avoid use of zero as the test value to maintain usefulness of the confidence interval.

Hypothesis 1: Auditors are less trusting than other groups

The null hypothesis, which this research seeks to reject, is that auditors exhibit the same level of trust/distrust bias as QFIs and layperson participants. That is, there is no difference between the belief-cynicism Bias sub-scale scores of auditors and other respondents. The mean level may be neutral (score of 0), or indicative of bias in either continuum direction.

$H1_0$ μ Auditor Bias = μ all other participants' Bias

If the null hypothesis is rejected, differences in mean bias scores would be explored between groups. If Trust is in itself a predictor of Neutrality, as is suggested by use of this same Trust scale in prior research, it would be expected that Auditors are less biased than Laypersons and QFI specialists. The alternative hypotheses are, therefore:

$H1_1$ μ Auditor Bias < μ Layperson Bias

$H1_2$ μ Auditor Bias < μ QFI Bias

For both alternate hypotheses to be supported, the mean auditor participant score will be lowest, of the three groups, on the belief-cynicism continuum. Although QFIs are expected to be most *sceptical* of all the groups, their work is predicated on the basis that fraud exists in the information they gather and analyse. Therefore QFIs are expected to take a Presumptive Doubt approach to scepticism, which would equate to a cynicism bias tendency in the Trust/Distrust items within the scepticism scale. This contrasts with the Neutral approach expected of Auditors. Therefore Auditors are expected to be less biased according to the Bias sub-scale.

Hypothesis 2 – Auditors have a more consistent Range of Biases than other groups

The groups' standard deviations were used to explore for greater consistency of characteristics within the Auditor group than in Non-sophisticated Laypersons. The null hypothesis, which this research seeks to reject, is that the Auditor group members' Trait characteristics are no more consistent than the Trait characteristics of laypersons:

$H2_0$ σ Auditor Bias = σ other participants' Bias

If the null hypothesis is supported, the notion of auditors exhibiting a less diverse range of default trait biases than non-auditors is not supported. The alternative hypothesis, testing for greater consistency of the Neutrality characteristic in the Auditor group, is:

$H2_1$ σ Auditor Bias < σ Non-sophisticated Layperson Bias

$H2_2$ σ Auditor Bias < σ QFI Bias

For the null hypothesis to be rejected, the range of auditor participants' bias scores would be narrower on the belief-cynicism continuum than other participants' scores, further elucidating the results of mean testing, above.

Skill Hypothesis

The testing in this section is conducted using scores derived from the Skill sub-scale items.

Hypothesis 3: Auditors are more Skilled than Laypersons, but less skilled than QFIs

The null hypothesis, which this research seeks to reject, is that auditors exhibit the same level of skill as all other participants. That is, there is no difference between the skill scores of auditors and other respondents.

$H3_0$ μ Auditor Skill = μ other participants' Skill

Given the professional requirements pertaining to Auditors, the alternate hypothesis is therefore:

$H3_1$ μ Auditor Skill > μ Non-Sophisticated Layperson Skill

However, the obligations of QFIs with regard to evidence are arguably greater than the requirements for Auditors. Therefore, the second alternative hypothesis is that Auditors' skill scores would be lower than QFI participants' skill scores :

$H3_2$ μ Auditor Skill < μ QFI Skill

The highest scores indicate greater skill, and the lowest scores indicate lesser skill. Therefore, for the alternate hypothesis 3_1 to be supported, the mean auditor participant score would be higher on the skill sub-scale, and for the alternate form of hypothesis 3_2 to be supported, the mean auditor participant score would be lower than the mean QFI score.

Scepticism Level Hypotheses

The Scepticism hypotheses are framed in accordance with the composite scoring system, described in section 4.7.2 Formal Scores, which combines the Trait and Skill factors. This score is expressed as a percentage, with the higher scores representing greater scepticism.

Hypothesis 4: Auditors have a more consistent range of Scepticism than other groups

The null hypothesis, which this research seeks to reject, is that there are no identifiable differences in the ranges of overall Scepticism scores, when compared between groups, to support the discussion of between-group Scepticism characteristics. Specifically, there is not enough homogeneity between the composite scores of auditors support meaningful discussion of those scores as distinct from any other respondents.

$H4_0$ σ Auditor Scepticism = σ Non-Sophisticated Layperson Scepticism

This research posits that if the null hypothesis is rejected, it may be possible to identify discrete differences between groups. To that end, alternative hypotheses explore whether the professional and Sophisticated Layperson groups reflect more consistent scepticism characteristics than Non-sophisticated Laypersons, as follows:

$H4_1$ σ QFI Scepticism < σ Non-sophisticated Layperson Scepticism

$H4_2$ σ Auditor Scepticism < σ Non-sophisticated Layperson Scepticism

$H4_3$ σ QFI Scepticism < σ Auditor Scepticism

$H4_4$ σ Sophisticated Layperson Scepticism < σ Non-sophisticated Layperson Scepticism

Hypothesis 5: Auditors' Scepticism level is higher than Laypersons', but lower than QFIs'

The null hypothesis, which this research seeks to reject, is that there are no identifiable differences in overall Scepticism scores between groups. Specifically, there is no difference between the composite scores of auditors and other respondents to suggest different levels of scepticism.

$H5_0$ μ Auditor Scepticism = μ Non-Sophisticated Layperson Scepticism

This research posits that if the null hypothesis is rejected, it may be possible to identify discrete differences between groups, and subsequently arrive at levels of scepticism. To that end, alternative hypotheses explore for expected differences, as follows:

$H5_1$ μ Sophisticated Layperson Scepticism > μ Non-sophisticated Layperson Scepticism

$H5_2$ μ Auditor > μ Sophisticated Layperson Scepticism

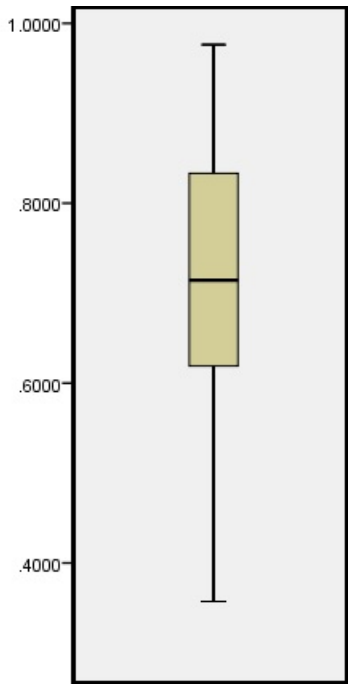
$H5_3$ QFIs have higher Scepticism than Auditors

Professional Scepticism Hypothesis

This hypothesis directly addresses RQ 2 by comparing Auditors' Scepticism scores with a benchmark that denotes the lower limit of a professional scepticism range.

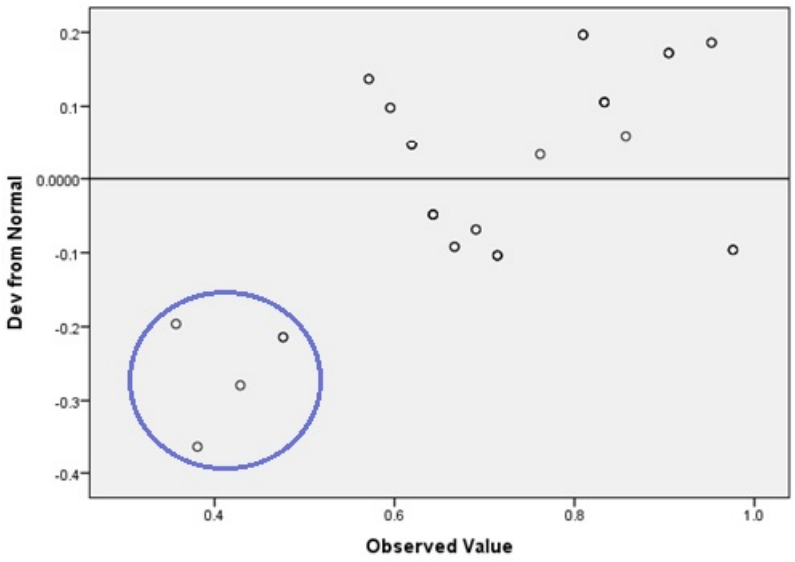
The lower limit of the professional scepticism range is derived from standard deviation statistic calculated using the unadjusted Raw Total scores of QFI participants. As reflected in Hypothesis 4, the QFI scores were expected to cluster quite closely, reflecting professional homogeneity. For the most part, this expectation was observed in the data collected from the sample, however the overall range of results extended across much of the scale, as is demonstrated in Figure 4.1, following.

Figure 4.1 QFI Scepticism Score Distribution Boxplot



The data were then explored to observe for the existence of any outliers which might unduly influence the results. A small, yet distinct, group of results at the trust end of the continuum was subsequently identified. This grouping is highlighted by the blue circle in Figure 4.2.

Figure 4.2 Detrended Normal Q-Q Plot: QFI Scepticism Scores



To utilise the QFI results, without undue effects of the outliers, the data was reduced by approximately 5 percent, so the results then reflected 95.4% of the QFI population, and eliminating outlier bias. This research thereby adopts the procedure used by Staheli et al (1987), who defined "the range of normal" in the same way. The procedure is appropriate for comparison of the QFI sample (n = 41) with the Auditor sample (n = 45) because "[w]ith the two standard deviation cutoff, bias has reached asymptote by a sample size of about 15 and it would seem safe to compare conditions with different numbers of observations as long as each had at least 20" (Miller, 1991, p.912).

The lower limit, or Professional Scepticism Benchmark, was therefore calculated using the following syntax:

Lower PS Limit = (1 – (σ / Raw Scepticism Score range) * 100) * 2

where the standard deviation is 7.426, and the possible Raw Scepticism Score range (of -26 to 42) is 68.

By applying this method, the lower limit of professional scepticism is 100 – 21.8 = 78.2%. Whilst it is noted that future studies, with much greater numbers of participants, may lead to revised standard deviations and thus revised attitude score ranges, for the purposes of this study, the above standard deviations set the boundaries of score ranges as follows:

Table 4.6 Scepticism Score Range Boundaries

Scepticism Attitude	**Score Range %**	**Established by Participant Group(s)**
Subjectivity	0 – 50	50th percentile representing the nexus of subjectivity and scepticism
Scepticism	51 - 77	Mid-range
Professional Scepticism	78* - 100	2 x QFI standard deviations of the maximum Scepticism score (100%)

* rounded

This means that, *at the time of testing*, subjects with scores of 78% or higher would be considered to have a default attitude of Professional Scepticism; subjects with scores in the range of 51 – 77% would be considered to have an attitude that encompasses scepticism; and subjects with scores of 50% or below would be considered to have a predominantly subjective attitude.

<u>Hypothesis 6: Auditors' Professional Scepticism is equal to, or higher than, the minimum benchmark for Professional Scepticism.</u>

Hypothesis 6, which predicts that Auditors are professionally sceptical, is expressed as follows:

H6 Auditor Scepticism > 78.15%

The proportion of Auditor group scores which meet or exceed the lower boundary represents, for the purpose of this research, the proportion of Auditors who exhibit indicators of professional scepticism.

4.9 Ethical considerations

This study was approved by the Tasmanian Social Sciences Human Research Ethics Committee, and assigned the ethics reference number H0013643. To satisfy the requirements of Ethics approval, a host website was utilised to centrally publish all relevant background material, a formal invitation to participate, a comprehensive participant information sheet, and a hyperlink to the online survey. The host website also stated the Ethics approval number and included contact information for the student researcher, supervisors and Ethics Committee. The matter of consent was addressed in the participant information sheet as well as in the online survey.

To elicit the most authentic responses from participants, use of the term "scepticism" was limited, and thus the title of the online research sites were labelled "What Do You Think?" rather than duplicating the title of the research thesis. The extent of limited disclosure is precisely defined as: omission of the specific term 'scepticism' from the Invitation, Information Sheet and Survey questionnaire. The term was, however, used at the end of the survey for the purpose of assessing participants' understanding of the term and self-reporting their personal level of scepticism, and in a disclosure at the very end of the survey, where participants were offered an opportunity to indicate if they wished their data to be withdrawn from the study. No participants withdrew at that stage.

The use of limited disclosure was not intended to mislead participants in any way, or to conceal the purpose of the research. Prospective participants were informed that

the purpose of the research was to measure how a particular balance of experience and knowledge are used to gather and assess information, which is the same issue expressed in layman's terms.

Use of the official research title in information provided to participants would have been counterproductive if it led to inconsistency between audit and non-audit definitions, which would damage the usefulness of the scale in that inter-group responses could not be combined or compared. That would undermine the purpose of the project, which is to explore and understand any differences identified.

The term "scepticism" is known to all auditors, as defined for this research. It is emphasised in the Auditing Standards, professional papers and regulatory recommendations, and is also prominent in legal cases against auditors. Therefore use of the term would very likely influence respondents in groups 1 and 2 to select what they perceive to be a 'most correct' answer rather than that which most reflects their true perspective. This would unduly bias the research data. The term is *not* understood in the same way by those outside the audit and related fields. However, this is equally as problematic because colloquial usage is usually to mean 'disbelief', 'doubt' or 'cynicism'. Such misinterpretation of the research purpose and questions would influence respondents in Group 3 to answer in ways that are not intended by the research.

No identifying information is asked of participants. All data is confidential, captured and stored electronically, and password protected. The research involves no immediate benefits to participants, nor any foreseeable risk other than the opportunity cost of volunteering time to complete the survey.

4.10 Summary

The methods chosen for this research address the research questions by deriving a purposeful scale of Professional Scepticism from existing subscales which match the constructs identified in the Model presented in Chapter 3. That Model emerged from review and synthesis of existing academic and professional literature, described in Chapter 2.

The use of a purposeful scale necessitated methods of refining the proposed instrument to assess its capacity to serve two purposes: Firstly, to capture data that reflected a broad range across the continuum of trait attitudes; and secondly, to derive a question set which was shown by the captured data to represent the two underlying factors of professional scepticism: an inherent (dis)trust trait, and scepticism skill. The scale refinement procedures resulted in inclusion of Wrightsman's (1991) complete Trust Scale in the professional scepticism test instrument, which revealed a serendipitous opportunity to utilise that sub-scale as an indicator of bias direction, to enhance interpretation of professional scepticism scores and inform means by which scepticism skills might be enhanced.

Further methods were chosen to match the hypotheses to specifically address the research questions of whether levels of scepticism were identifiable, and if participants in the auditor group of participants express traits and skills which combine to reflect a professional level of scepticism.

Finally, methods were chosen to utilise the supplementary data collected by the instrument, but which was not included in the scepticism scale, to further explore the rigour of the scale in terms of its capacity to capture the relevant constructs, and to explore for differences in individuals' ability to self-assess their sceptical position.

Chapter 5: Data Analysis Results

5.1 Introduction

This chapter is structured to reflect the Method described in Chapter 4: After defining a usable data set, descriptive statistics were derived, and the participant groups are presented. Next, the results of testing the research hypotheses are reported, followed by a summary of all groups' scepticism range results. Discussion of the results is presented in Chapter 6.

5.2 Defining the Data Set

Data was gathered via the online survey between 3rd February 2014 and 9th April 2014 and downloaded in Excel format for initial analysis. According to Survey Monkey, the number of participants at the time of data download was 360, but only 296 of those participants had appropriately completed the survey.

The responses were then inspected for eligibility. One pair of entries was deemed to have been made by a single layperson individual, several weeks apart, after having completed a fraud course. The first of the two entries was retained because it was considered more representative of that participant's default Trait and Skill position, and less likely to be prejudiced by repetition and the recency of this new fraud-related experience (Arnold et al, 2000; Cushing & Ahlawat, 1996). A further four sets of data were excluded, because those respondents indicated being less than 18 years old, which did not satisfy the ethical approval criteria.

The final usable participant data represented a sample size of n = 291, including more than the target minimum of 30 participants for each of the QFI and Auditor groups.

5.3 Participant Groups

Respondents' data were categorised to the QFI, Auditor or Layperson groups according to their responses to direct questions about roles and qualifications. To reduce coder error, the group codes were automatically assigned via a Microsoft Excel IF function.

All participants were thereby initially allocated to the three groups, as follows:

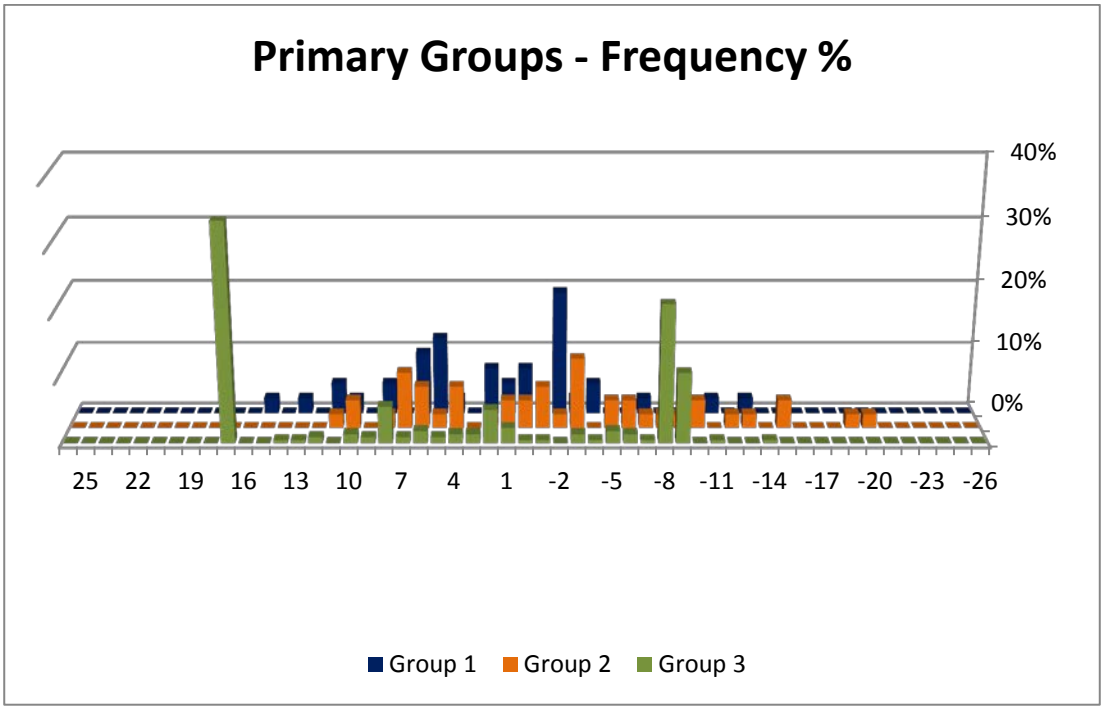
Table 5.1 Initial Group Allocations

Group		**n**
1	QFIs	41
2	Auditors	45
3	Laypersons	205
n =		291

Each group contains more than 30 members, which was predetermined as the minimum number of group participants required for the purpose of statistical analysis. However, before addressing the hypotheses, the groups' data were subjected to further inspection to verify that a broad enough range of data were captured across the Trait continuum, which forms the basis of the research model. For this purpose, results of the well-established Wrightsman Trust Scale (1991) were plotted and compared.

Figure 5.1 illustrates frequency distributions for each of the three initial groups. It is observed that the majority of QFI and Auditor group members' responses cluster around the central point of greatest scepticism, represented by a score of 0. In contrast, most participants in group 3 have scores which reflect higher levels of trust and distrust.

Figure 5.1 Trait Frequency Distribution



Whilst a higher degree of bias amongst Laypersons is consistent with expectations formed during the literature review, the result was not as evenly distributed as expected, prompting further exploration of Group 3.

The exploration revealed that Group 3 participants who reported some practical experience of fraud, or informal fraud training, or accounting training that does not encompass employment in auditing or fraud fields, exhibited higher levels of distrust. This group included, for example, company accountants, executives and managers

who have studied accounting and/or undertaken informal fraud-related training. In contrast, Group 3 participants without such training exhibited higher levels of trust. As the distinction between participant sub-groups was clear, the initial Group 3 participants were re-coded and reassigned to separate groupings.

This re-coding and reassignment resulted in a revised Group 3, consisting of Sophisticated Laypersons; and a new Group 4, being Non-sophisticated Laypersons. The terminology was chosen match the nature of the differentiation, which is essentially related to (non)sophisticated use of financial information. Consequently, the 291 usable data sets were divided amongst four stratified groupings as follows:

Table 5.2 Final Participant Groupings

Group		n
1	QFIs	41
2	Auditors	45
3	Sophisticated Laypersons	52
4	Non-sophisticated Laypersons	153
n =		291

5.4 17-item Scale Descriptive Statistics

This section presents the general demographic characteristics of the participants, followed by summaries of statistics describing the performance of each group across the sub-scales and professional scepticism scale.

5.4.1 Demographic Data

This section describes the demographic characteristics of the participants.

Forty four percent (127) of respondents were female, and fifty six percent (164) were male. All of the study's age categories were represented, as illustrated in figure 5.2:

Figure 5.2 Participant Ages

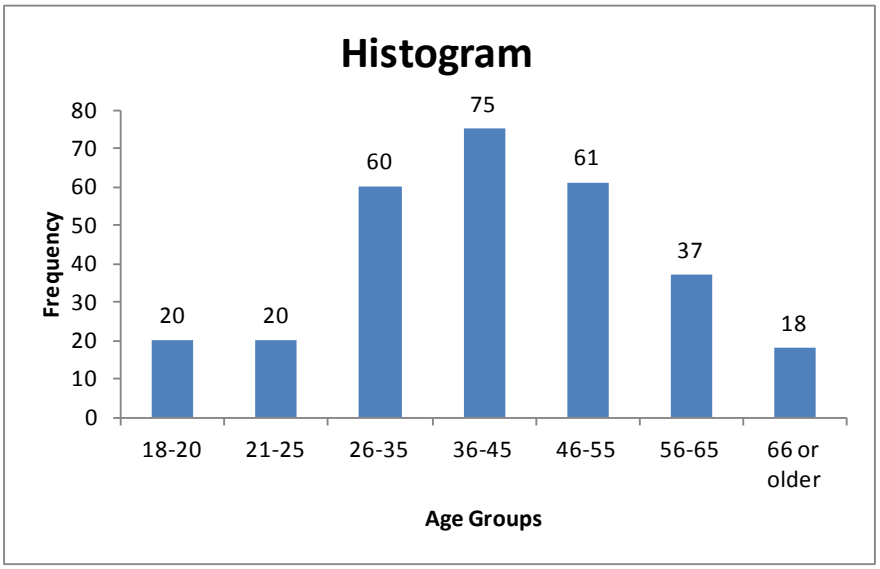
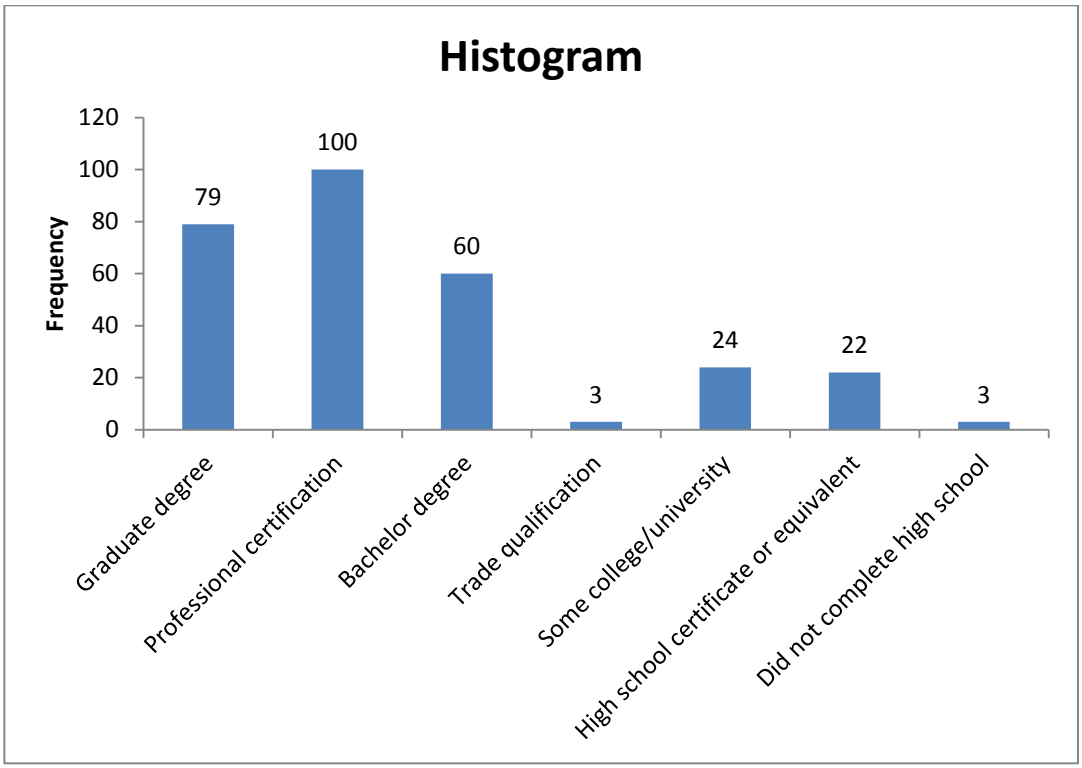


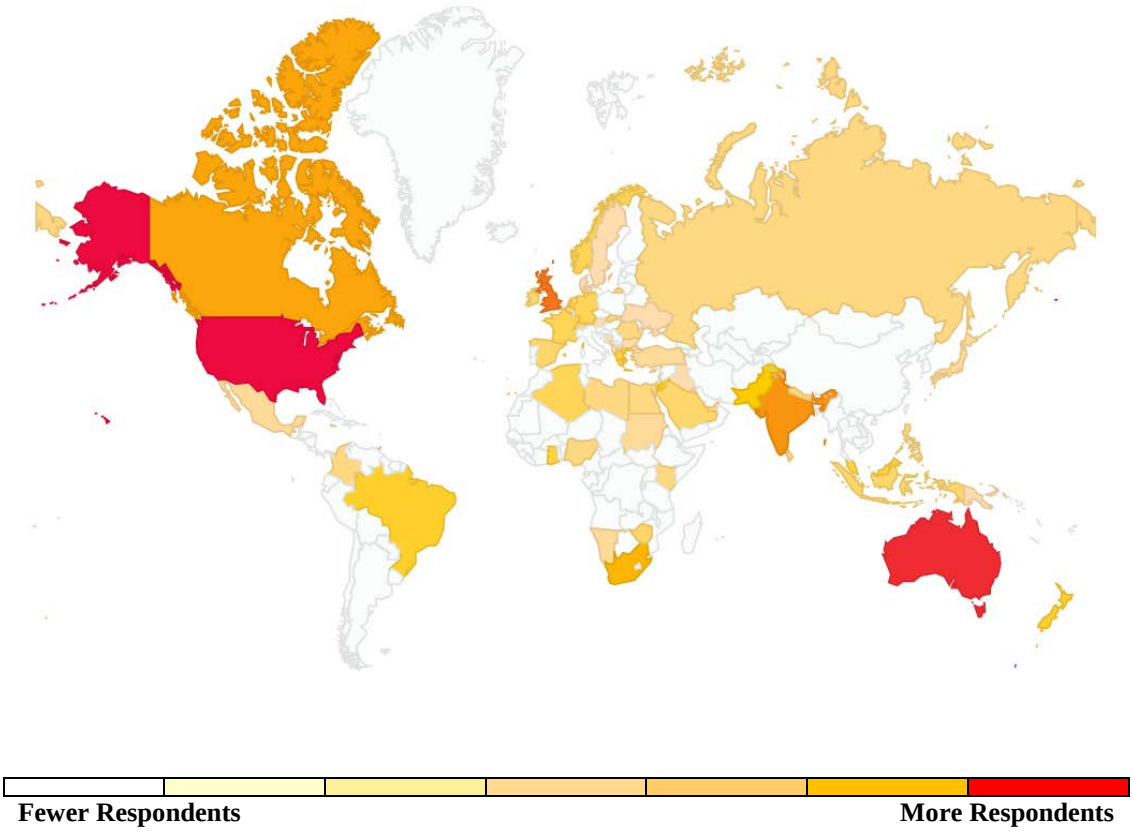
Figure 5.3 illustrates that eighty two percent of participants held a bachelor degree or higher.

Figure 5.3 Participant Education



According to Survey Monkey, the 360 survey attempts were made from locations in sixty four countries across the globe. The following figure illustrates the distribution of access, with the regions of most prolific access highlighted by darker colours.

Figure 5.4 Countries of Access



The respondent data support the dominance of responses from English speaking western regions, with seventy percent of respondents reporting that they live mainly in Australia, USA, Canada or England.

5.4.2 Summary of Scale Score Statistics

The means and standard deviations of group scores were important for the purpose of defining levels of scepticism, because this information facilitated observations of score clustering within groups, and observations of differences between groups.

The table on the following page summarises the performance of each group across the sub-scales and professional scepticism scale.

Table 5.3 Summary of Scale Scores per Group

Variable	Group	Theoretic Min/Max	Actual Min/Max	Mean	SD
BIAS	QFI	-26 :+26	-12 : + 16	2.854	5.9982
	Auditors	-26 :+26	-19 : +12	-.844	7.9600
	SL	-26 :+26	-8 : +9	-1.212	6.9093
	NSL	-26 :+26	-13 : +18	7.373	11.2272
TRAIT	QFI	.000000:1	.3929 : .9643	.737805	.1520711
	Auditors	.000000:1	.0643 : 1	.773810	.1539899
	SL	.000000:1	.5000 : 1	.826923	.1774312
	NSL	.000000:1	.0714 : 1	.497199	.4171716
SKILL	QFI	.000000:1	.2143 : 1	.649826	.2252011
	Auditors	.000000:1	.2143 : 1	.714286	.2137439
	SL	.000000:1	.3571 : 1	.682692	.2071228
	NSL	.000000:1	.2857 : 1	.813259	.1530929
SCEPTICISM	QFI	.000000:1	.3571 : .9762	.716609	.1651122
	Auditors	.000000:1	.4524 : 1	.764550	.1537364
	SL	.000000:1	.5238 : .9762	.778846	.1684470
	NSL	.000000:1	.3333 : 1	.604420	.2860812

These statistics were fundamental to the testing of the hypotheses in the next section.

5.5 Data Distributions

Very skewed distributions were expected from the QFI and Auditor groups in terms of Scepticism, as well as the Skill and Trait sub-scales, because it was anticipated that the majority of participants would score highly. A flatter distribution was expected from the Layperson group(s), for Bias questions in particular, because these participants were expected to reflect a broad range of attitudes, divergent from the more neutral, evidenced-based perspectives of the professional participants. Nonetheless, the extreme differences in distributions were surprising, particularly in terms of the extreme Bias scores evident in the Non-sophisticated Layperson bimodal distribution.

The distributions for Scepticism and each sub-scale, per group, are presented in the following table. The normal distributions are highlighted in blue rows[14].

[14] For the purposes of this research, the Shapiro-Wilk statistic was used for all groups' data, even though the Kolmogorov-Smirnova method would ordinarily be used for samples >50, such as the Sophisticated Layperson group (n = 153). This is because the Shapiro-Wilk statistic has been found to handle samples of up to 2,000 (Lund Research Ltd, 2013), and consistent results were noted between the methods presented in Table 5.4.

Table 5.4 Data Distributions

Tests of Normality

	GROUP	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Scepticism	1	.103	41	.200*	.963	41	.208
	2	.171	45	.002	.924	45	.006
	3	.274	52	.000	.800	52	.000
	4	.286	153	.000	.747	153	.000
Trait	1	.101	41	.200*	.954	41	.096
	2	.177	45	.001	.933	45	.012
	3	.281	52	.000	.761	52	.000
	4	.304	153	.000	.747	153	.000
Skill	1	.114	41	.200*	.953	41	.087
	2	.153	45	.010	.935	45	.014
	3	.262	52	.000	.849	52	.000
	4	.384	153	.000	.702	153	.000
Bias	1	.114	41	.200*	.971	41	.369
	2	.102	45	.200*	.966	45	.207
	3	.241	52	.000	.793	52	.000
	4	.292	153	.000	.754	153	.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The abundance of non-normal distributions has presented substantial challenges for testing of hypotheses which were designed to involve comparison of means between groups. However, given that this research involved groupings of attitudes, for the purpose of establishing levels, the ranges of scores per group, were as important as the means of scores. In this light, the shapes of the distributions did not compromise the research because non-parametric tests were used. Rather, the shapes of the distributions offer support to the research expectations of participant behaviour, and contribute positively to the establishment of levels of scepticism.

The challenges were in choosing appropriate statistical tests for scale-form data, which would not violate the common normality assumption. Consequently, non-

parametric alternatives, such as Mann Whitney U Tests, Levene tests for Equality of Variances Assumed, and Wilcoxon Ranked Sign Tests, were frequently used.

5.6 Testing of Hypotheses

In chapters 3 and 4, hypotheses were developed to address the research questions by exploring the following issues:

1) Trait Range;
2) Skills;
3) Levels of Scepticism; and
4) Professional scepticism.

The results of testing these hypotheses are presented in turn, as follows.

5.6.1 Trait Range Hypotheses

Hypothesis 1

The null hypothesis, which this research seeks to reject, is that auditors exhibit the same level of trust/distrust bias as QFIs and all layperson participants.

Alternate 1: Auditor/Layperson Bias

The Shapiro-Wilk statistic (.809, df 205, sig. < .001) confirmed that the combined Laypersons groups' data violated the normality assumption, so a Mann Whitney U Test was used to determine whether the mean of Auditor Bias was significantly less than the mean of Layperson Bias.

Laypersons (mean rank = 131.98, n = 205), U = 3284.5, z = -3.070, p = .001, two-tailed, ranked significantly higher than Auditors (mean rank = 95.99).

Bias score has a range of -26 to +26. A mean score of 0 suggests the greatest neutrality or least bias. A negative score signifies distrust, while a positive score signifies trust. The mean score for auditors is –0.844, indicating that Auditors are neutral on this scale. In contrast, the mean Laypersons score is +7.33, which maps these participants as trusting.

Table 5.5 H1 Alt1 Summary

GROUP		N	Minimum	Maximum	Mean	Std. Deviation
Auditors	BIAS	45	-19.0	12.0	-.844	7.9600
Layperson	BIAS	153	-13.0	18.0	7.373	11.2272

This test result was significant (p = .001), indicating that there is enough evidence to support the alternate hypothesis that, on average, Auditors are less biased than Laypersons.

Alternate 2: Auditor/QFI Bias

A *t* test was used to compare the mean of Auditor group's Bias scores (M = -.844, SD = 7.96) with the mean of QFIs' Bias scores, being 2.854. Auditors scored 3.699 points, 95% CI [-1.307, -6.090], below the other group's average. This difference is statistically significant, $t(44) = -3.117$, p = .002, two-tailed, and moderate at $d = 0.465$.

The Shapiro-Wilk statistic (.971, df 41, sig. = .369) and visual inspection of the frequency histogram and stem-and-leaf plot confirmed that the QFIs' scores were approximately normally distributed.

As above, the mean score for auditors is –0.844, indicating that Auditors are neutral on this scale. In contrast, the mean QFI score is +2.854, indicating a moderate trust bias (d = 0.465).

Table 5.6 H1 Alt2 Auditor/QFI Bias

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Auditor Bias	45	-19.0	12.0	-.844	7.9600
QFI Bias	41	-12.0	16.0	2.854	5.9982

The results of this test were significant (p = .002), indicating that there is enough evidence to support the alternate hypothesis that, on average, Auditors are less biased than QFIs.

Hypothesis 2

The null hypothesis, which this research seeks to reject, is that the Auditor group members' Bias characteristics are no more consistent than the Bias characteristics of other groups.

Alternate 1: Auditor/Non-sophisticated Layperson ranges

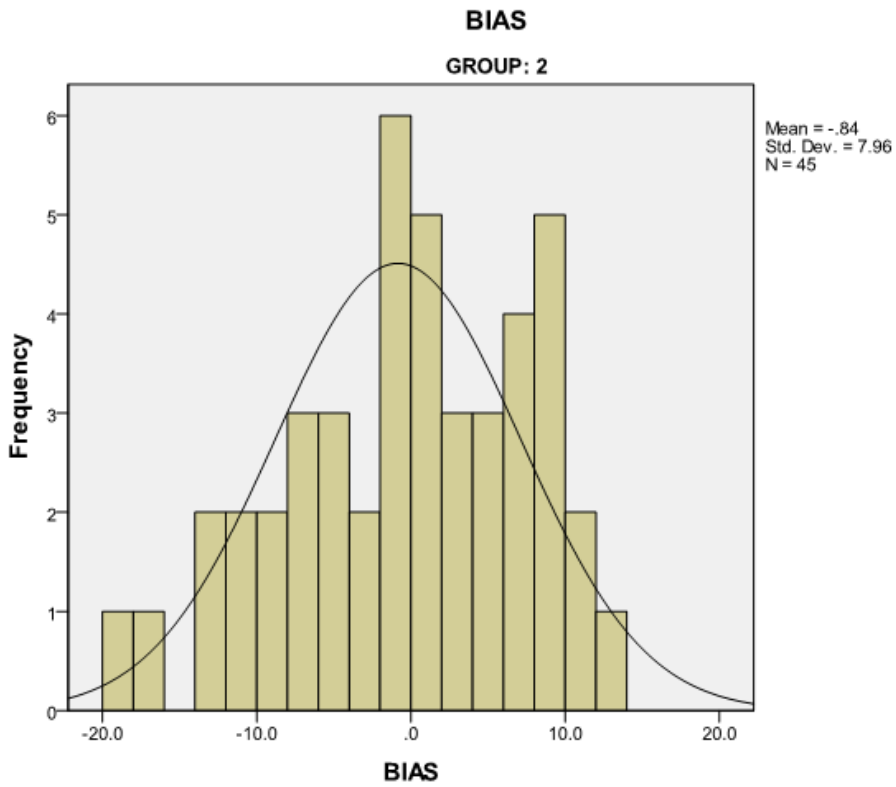
The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the distribution of Auditor Bias data were normally distributed (.966, df 45, p = 0.207), but the Non-sophisticated Layperson Bias data (.754, df 153, p<.001) were not. Therefore a Levene test for Equality of Variances was utilised.

The results were significant, indicating that the variances are not equal (F = 32.645, Sig. <.001). A t-test for 'Equal Variances Assumed' reveal a mean difference of 8 scale points (-8.2170), (t = -5.500, df 100.586, p <.001, two tailed).

This test revealed marked differences in the ranges of scores for the Auditor and NSL groups.

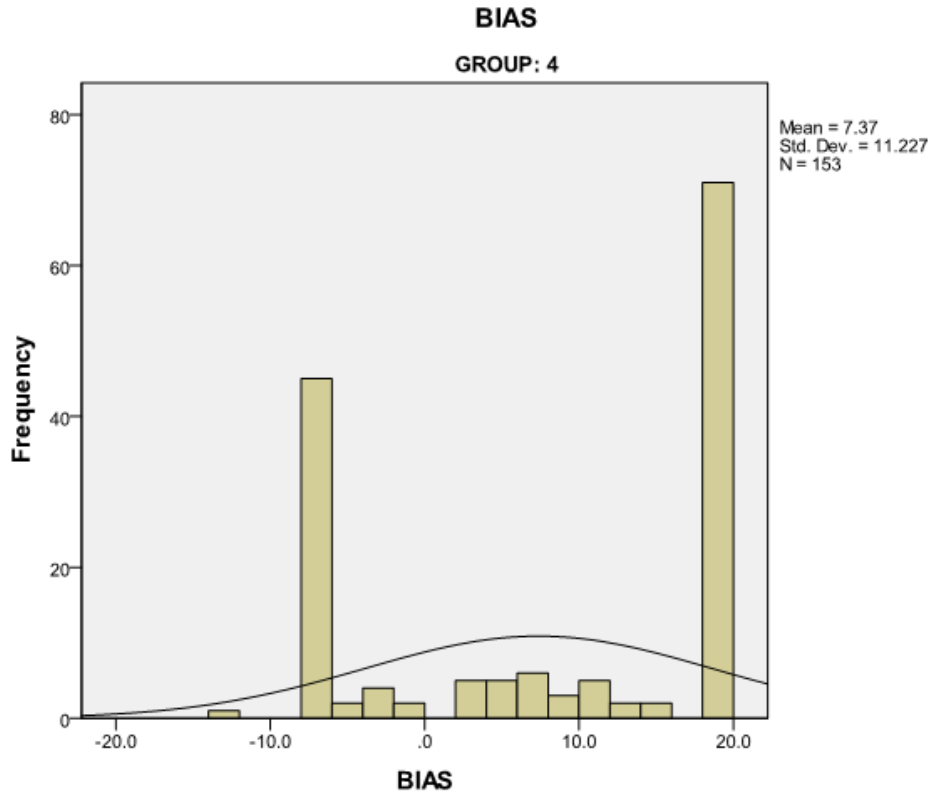
The Auditors' scores range from -19 to +12, and are distributed in a normal manner (SW .966, df 45, p = .207), as illustrated in the following diagram.

Figure 5.5 H2 Alt1 Auditor Bias Distribution



In contrast, the NSL scores are dispersed between two strong clusters, as depicted in Figure 5.6, below. One cluster of scores is largely trusting, and the other is largely distrusting.

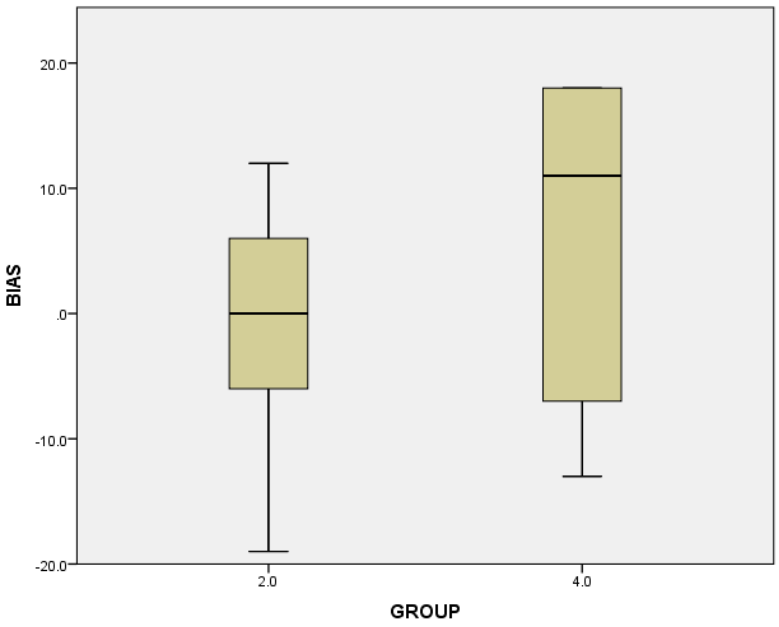
Figure 5.6 H2 Alt1 NSL Bias Distribution



This indicates that there are two sub-groups of NSLs which drive the bias profiles, ranging from -7 to +18. Differences in these sub-groups do not seem driven by age or gender.

The following boxplot depicts the means, ranges and two standard deviations of the means for the Auditor (1) and Non-sophisticated Layperson (2) groups. It illustrates the NSL mean at the Trust extreme of the Auditor response range, and a much greater standard deviation, which encompasses much of the entire range of its group's scores.

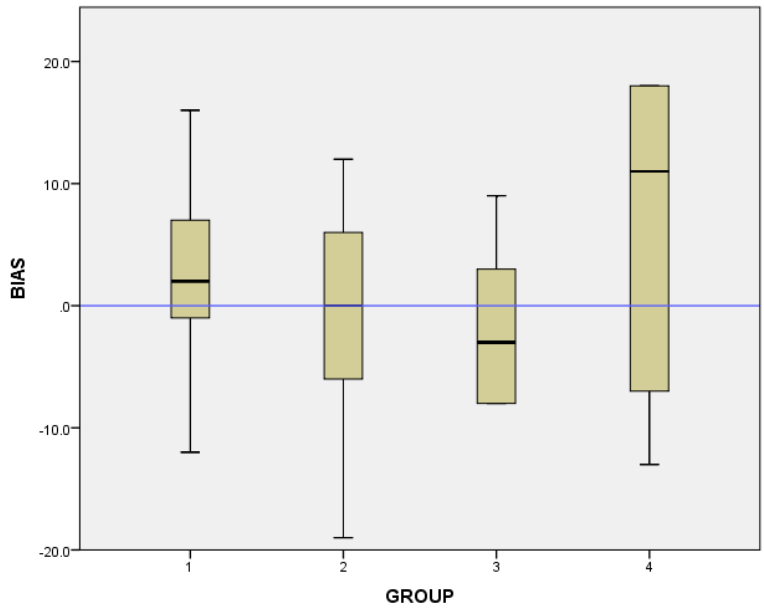
Figure 5.7 H2 Alt1 Relative consistency of Auditor v NSL Biases



This illustrates that the majority of Auditors exhibit a far narrower range of biases when compared to the majority of non-sophisticated members of the general public, whose bias positions span much more of belief-cynicism continuum.

The results of this test were significant ($p < .001$), providing evidence that Auditors have a narrower range of biases than NSLs, around significantly different means, and therefore these groups have very different Bias profiles underlying Traits across different ranges of the Trait continuum. This is evident in the following chart, where the blue line indicates the point of greatest Neutrality.

Figure 5.8 H2 Summary of Bias ranges – All groups



Alternate 2: Auditor/QFI ranges

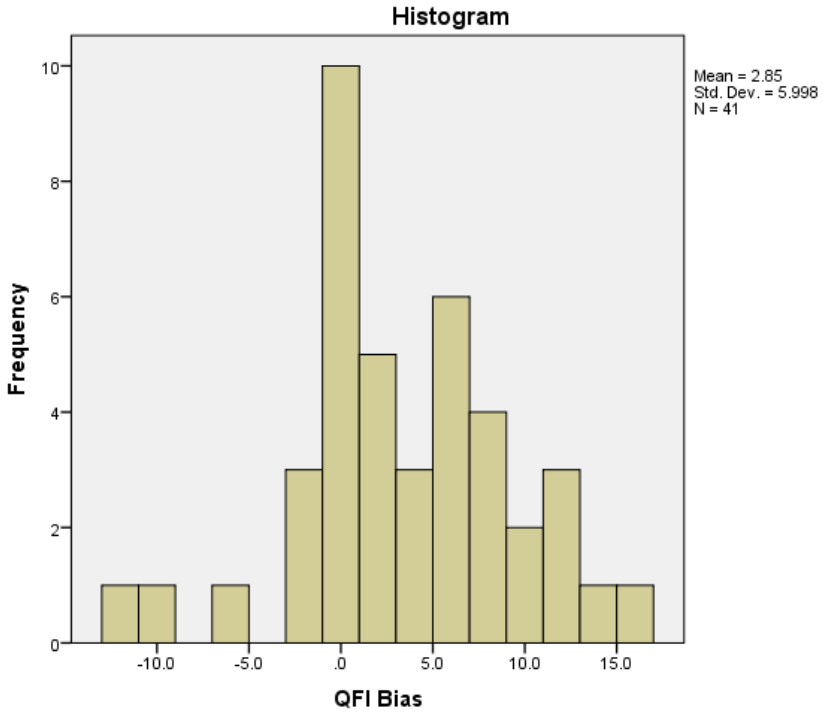
The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the distribution of QFI data were normally distributed (.971, df 41, p = .369). A Levene test for Equality of Variances was utilised for consistency with Alternate 1.

The results were not significant, indicating that the variances are equal (F = 3.630, Sig. = .060). A t-test for 'Equal Variances Assumed' reveal a significant mean difference of almost 4 scale points (-3.6981), (t = -2.415, df 84, p = .018, two tailed).

This test revealed no significant differences in the distribution of scores for the Auditor and QFI groups.

The QFIs' scores range from -12 to +16, and are distributed in a normal manner (SW .971, df 41, p = .369), as illustrated in the following diagram. This is similar to the range of Auditors' scores, being -19 to +12.

Figure 5.9 H2 Alt2 QFI Bias Distribution



This distribution is not significantly different (sig. = .060) to Auditor Bias, presented in Figure 5.6, above. However, whilst the shapes and ranges of scores are similar, the significantly different means (p = .018), suggest that the Bias profiles of these two groups occupy different ranges of the Trait continuum.

The results for this Alternate mean that Auditors have Neutral Traits, whilst QFIs have trusting Traits, but there is not enough evidence to reject the Null hypothesis because both groups' scores are equally consistent.

5.6.2 Skills

Hypothesis 3

Alternate 1: Auditor/NSL Skill

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the Skill scores of Auditors (.935, df 45, sig. = .014) and of Non-Sophisticated Laypersons (.702, df 153, p = .000), were not normally distributed. Therefore a Mann Whitney U Test was used to determine whether the mean of Auditor Skill was significantly higher than the mean of Non-sophisticated Laypersons' Skill.

Non-Sophisticated Laypersons (mean rank = 104.49, n = 205), U = 2678.5, z = -2.350, p = .018, two-tailed, ranked significantly higher than Auditors (mean rank = 82.52).

This test revealed significant difference between these groups, but the direction of difference was the opposite of expectations. That is, that NSLs' Skill was, on average, significantly (p = .018) higher than Auditor Skill.

The minimum and mean NSL scores were higher than Auditors, as summarised in the following table.

Table 5.7 H3 Alt1 Auditor/NSL Skill

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Auditor Skill	45	.2143	1.0000	.714286	.2137439
NSL Skill	153	.2857	1.0000	.813259	.1530929

Although both groups achieved scores at the maximum end of the Skill sub-scale, and the range of scores was similar, the table also reveals that the standard deviation of NSL scores was much smaller. This means that Auditors have greater diversity of Skill levels, contrasting with a majority of NSLs having similar Skills, as depicted in the following two charts.

Figure 5.10 H3 Alt1 Auditor Skill

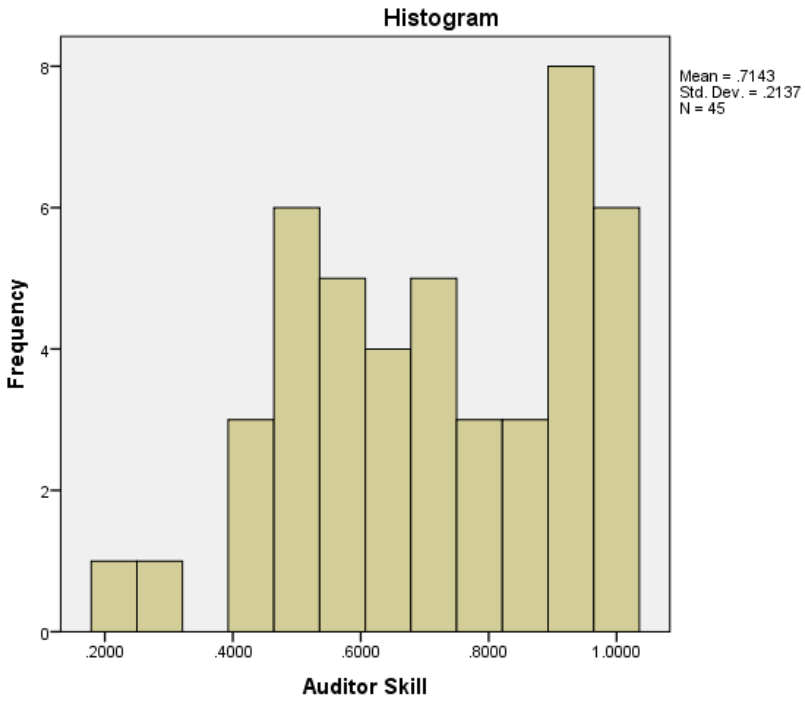
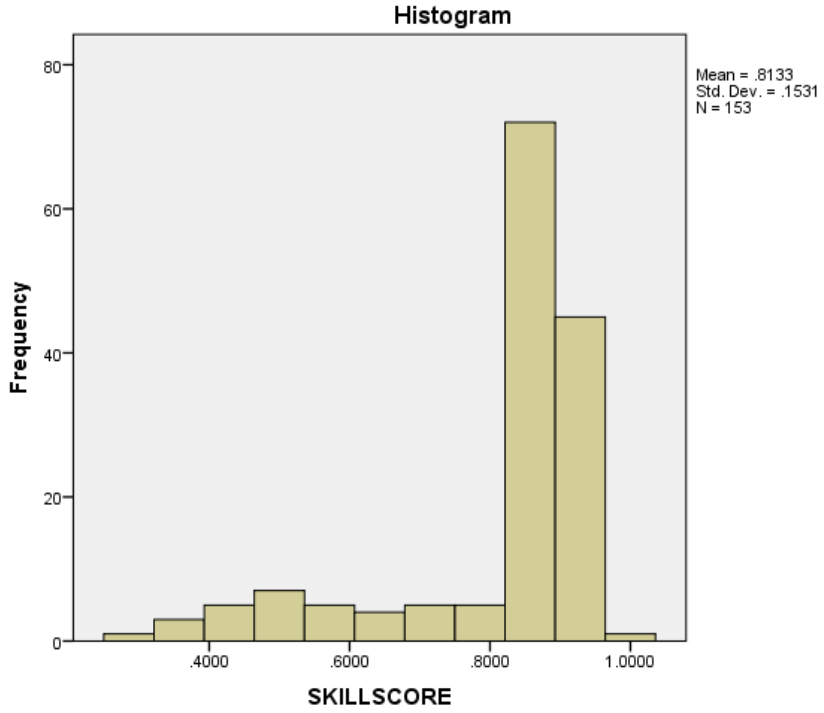


Figure 5.11 H3 Alt1 NSL Skill



This test provides evidence to reject the null hypothesis of equal Skill, but there is not enough evidence to support the alternate hypothesis that, on average, Auditors are more skilled than Non-sophisticated Laypersons because the difference was the other way around.

Alternate 2: Auditor/QFI Skill

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the Skill scores of QFIs (.953, df 41, sig. = .087) were normally distributed. However, as the Auditor data are not (.935, df 45, sig. = .014), a Mann Whitney U Test was used to determine whether the mean of Auditor Skill was significantly lower than the mean of QFIs' Skill.

QFIs' (mean rank = 39.70, n = 41), U = 766.5, z = -1.356, p = .087, one-tailed, ranked lower than Auditors (mean rank = 46.97), but the result was not significant.

This test revealed no significant difference between these groups. From the data, it was observed that both groups shared the same minimum and maximum scores, and although the QFI Skill was slightly lower, on average, than Auditors, the difference was not statistically significant (p = .087).

The minimum and mean NSL scores were higher than Auditors, as summarised in the following table.

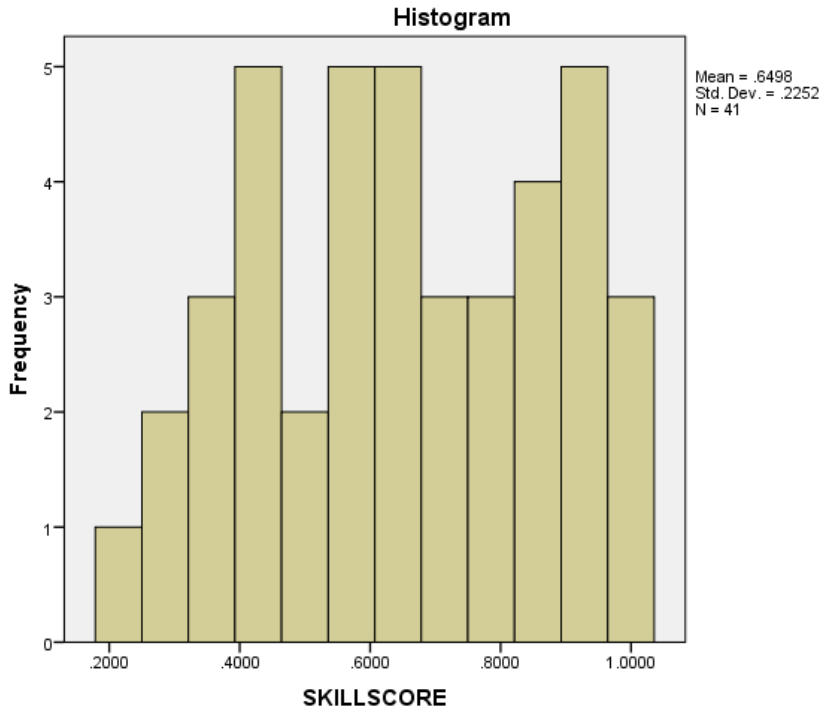
Table 5.8 H3 Alt2 Auditor/QFI Skill

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Auditor Skill	45	.2143	1.0000	.714286	.2137439
QFI Skill	41	.2143	1.0000	.649826	.2252011

The diversity of QFI skills, as depicted in the following chart, is similar to Auditors', shown in Figure 5.10, above.

Figure 5.12 H3 Alt2 QFI Skill



This test indicates there is not enough evidence to support the alternate hypothesis that, on average, Auditors are less skilled than QFIs. However, overall, the Null hypothesis is rejected by virtue of Non-sophisticated Laypersons and Auditors not having equal Skills.

5.6.3 Scepticism Level Hypotheses

Hypothesis 4

The null hypothesis, which this research seeks to reject, is that there are no identifiable differences in the ranges of overall Scepticism scores, when compared between groups, to support the discussion of between-group Scepticism characteristics.

H4 Alternate 1: QFI Range Differentiation

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the QFI Scepticism (.963, df 41, p =.208) was normally distributed, but Non-sophisticated Layperson Scepticism (.747, df 153, p <.001) violated the normality assumption with a marked U-shaped bimodal distribution. Therefore, a Levene test for Equality of Variances was utilised.

The results were significant, indicating that the variances are not equal (F = 61.418, Sig. <.001). A t-test for 'Equal Variances Assumed' reveal a mean difference of 11 scale points (.1121890), (t = 3.239, df 111.291, p = .002, two tailed).

This test revealed significant difference between these groups. Although these groups shared similar ranges of Scepticism scores, as indicated in the following table, the clustering of scores within those ranges was significantly different (p = .002).

Table 5.9 H4 Alt1 QFI/NSL Scepticism

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
QFI Scept	41	.3571	.9762	.716609	.1651122
NSL Scept	153	.3333	1.0000	.604420	.2860812

The following two histograms illustrate a normal shaped distribution of QFI scores, which contrasts markedly with the inverse-of-normal bimodal NSL distribution. It is evident that NSLs' scepticism is less consistent than QFIs'.

Figure 5.13 H4 Alt1 QFI Scepticism Range

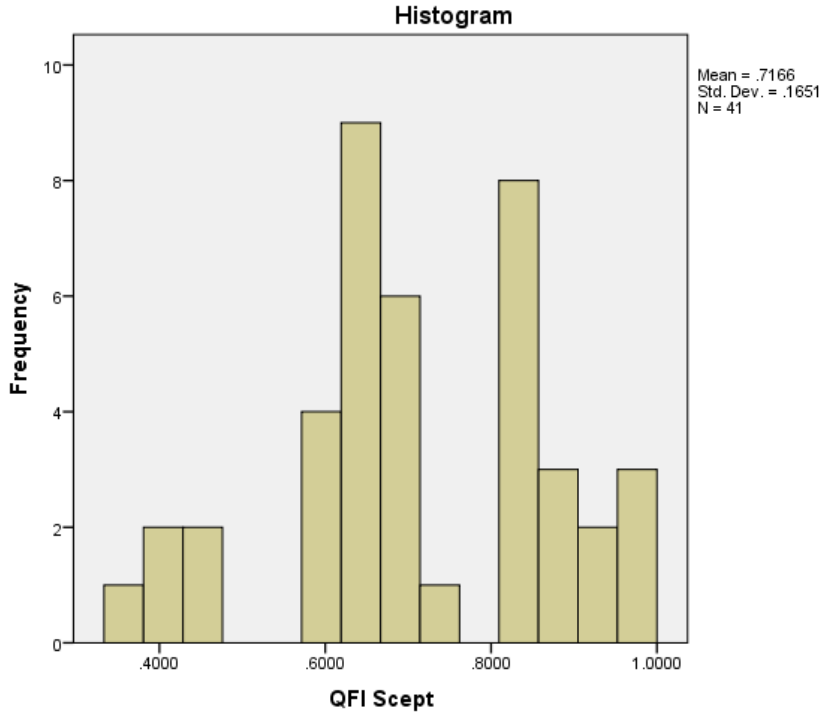
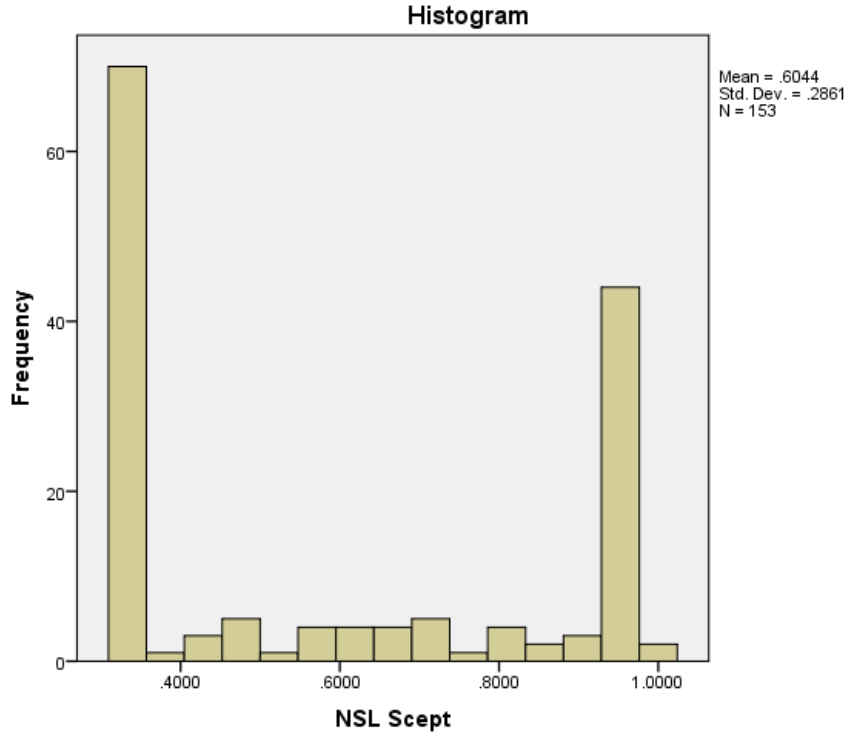


Figure 5.14 H4 Alt1 NSL Scepticism Range



This test provides evidence in support of Alternate 1 that QFI Scepticism (M = .716609, SD = .1651122) is more consistent than Non-sophisticated Layperson Scepticism (M = .604420, SD = .2860812).

H4 Alternate 2: Auditor Range Differentiation

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the Auditor Scepticism (.924, df 45, p = .006) and Non-sophisticated Layperson Scepticism (.747, df 153, p <.001) were not normally distributed.

A Levene test for Equality of Variances was utilised. The results were significant, indicating that the variances are not equal (F = 73.595, Sig. <.001). A t-test for 'Equal Variances Assumed' reveal a mean difference of 16 scale points (.160130), (t = 4.918, df 137.868, p <.001, two tailed).

This test revealed significant difference between these groups. Although these groups shared similar ranges of Scepticism scores, as indicated in the following table, the clustering of scores within those ranges was again significantly different (p < .001).

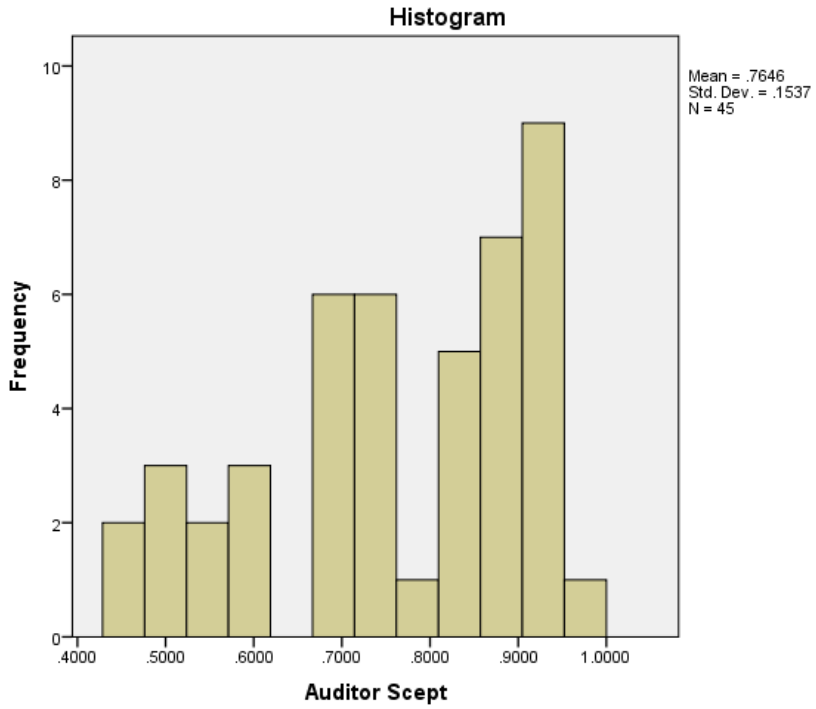
Table 5.10 H4 Alt2 Auditor/NSL Scepticism

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
QFI Scept	41	.3571	.9762	.716609	.1651122
NSL Scept	153	.3333	1.0000	.604420	.2860812

Auditor Scepticism scores were not normally distributed; instead skewed toward the higher end of the scale. The following histogram illustrates that skew, which again contrasts with the inverse-of-normal bimodal NSL distribution.

Figure 5.15 H4 Alt2 Auditor Scepticism Range



This test provides evidence in support of Alternate 2 that Auditor Scepticism (M = .764550, SD = .1537364) is more consistent than Non-sophisticated Layperson Scepticism (M = .604420, SD = .2860812).

H4 Alternate 3: Differentiated QFI & Auditor Ranges

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the QFI Scepticism (.963, df 41, p = .208) was normally distributed, but Auditor Scepticism (.924, df 45, p = .006) was not.

A Levene test for Equality of Variances was utilised. The results were not significant, and indicated that the variances are assumed equal (F = .015, Sig = .902). A t-test for 'Equal Variances Assumed' reveal a mean difference of only 5 scale points (.0479417), (t = -1.394, df 84, p = .167, two tailed).

This test revealed no significant difference between these groups. QFIs and Auditors shared similar means and ranges of Scepticism scores, and those scores clustered in similar ways, as indicated in the following table (p < .001).

Table 5.11 H4 Alt3 QFI/Auditor Scepticism Ranges

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
QFI Scept	41	.6190	.3571	.9762	.716609	.1651122
Auditor Scept	45	.5476	.4524	1.0000	.764550	.1537364

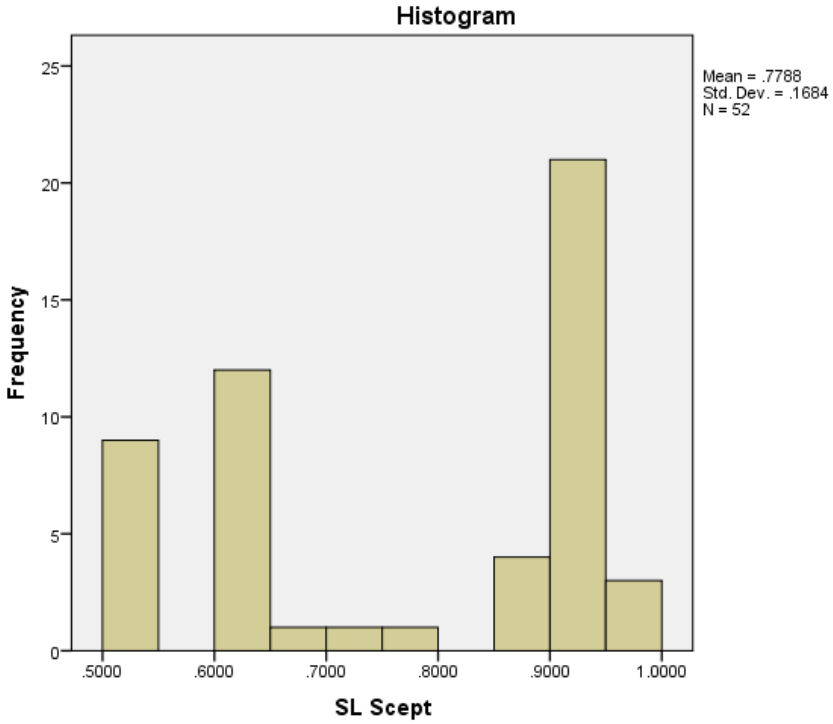
This test provides not provide enough evidence to support Alternate 3 that QFI Scepticism (M = .716609, SD = .1651122) is more consistent than Auditor Scepticism (M = .764550, SD = .1537364).

H4 Alternate 4: Differentiated SL & NSL Ranges

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that both Sophisticated Layperson Scepticism (.800, df 52, p <.001) and Non-sophisticated Layperson Scepticism (.747, df 153, p <.001) violated the normality assumption.

The shape of the SL Scepticism score distribution resembles the NSL distribution in that it is bimodal, as shown in the following chart.

Figure 5.16 H4 Alt4 SL Scepticism Range



A Levene test for Equality of Variances was utilised. The results were significant, indicating that the variances are not equal (F = 59.264, Sig. <.001). A t-test for 'Equal Variances Assumed' reveal a mean difference of 17 scale points (.1744266), (t = 5.306, df 151.238, p < .001, two tailed).

However, the distribution of SL scores accommodates a significantly narrower range, reflected by a significantly smaller standard deviation (p <.001, two tailed).

Table 5.12 H4 Alt4 SL/NSL Scepticism Ranges

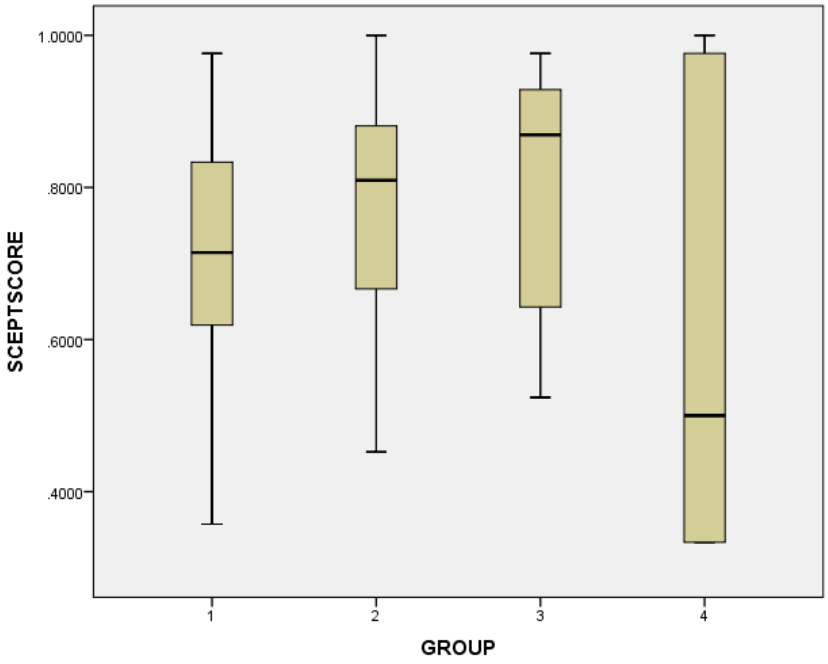
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
SL Scept	52	.5238	.9762	.778846	.1684470
NSL Scept	153	.3333	1.0000	.604420	.2860812

This test provides evidence in support of Alternate 4 that Sophisticated Layperson Scepticism (M = .778846, SD = .1684470) is more consistent than Non-sophisticated Layperson Scepticism (M = .604420, SD = .2860812).

For Hypothesis 4, overall, the relative similarities and differences between Scepticism scores for each of the participant groups are illustrated as follows:

Figure 5.17 Boxplot of all groups' Scepticism score ranges



Hypothesis 5

The null hypothesis, which this research seeks to reject, is that there is no difference between the composite scores of auditors and other respondents to suggest different levels of scepticism.

H5 Alternate 1: SL/NSL Scepticism Averages

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the Sophisticated (.800, df 52, p < .001) and Non-sophisticated Layperson Scepticism (.747, df 153, p < .001) were not normally distributed. As the distributions shared similar distribution shapes and spreads, a Mann Whitney U Test was utilised.

Sophisticated Laypersons Scepticism (mean rank = 124.28, n = 52), ranked higher than Non-sophisticated Layperson Scepticism (mean rank = 95.77), and the result was significant (U = 2871.5, z = -3.076, p = .001, one-tailed).

This test revealed that SLs are, on average, significantly more sceptical than NSLs (p = .001, one-tailed). In addition to having more homogenous scores, as indicated by Hypothesis 4, SL Scepticism is, on average, significantly higher than NSL scepticism.

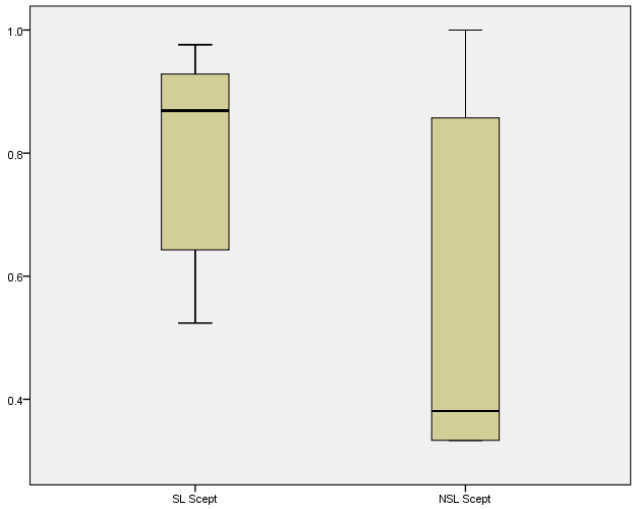
Table 5.13 H5 Alt1 SL/NSL Scepticism Averages

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
SL Scept	52	.4524	.5238	.9762	.778846	.1684470
NSL Scept	153	.6667	.3333	1.0000	.604420	.2860812

The average scores for each group are depicted by the horizontal black lines in the following boxplots.

Figure 5.18 H5 Alt1 SL/NSL Scepticism levels



This test indicates there is enough evidence to support the alternate hypothesis that, on average, Sophisticated Laypersons are more sceptical than Non-Sophisticated Laypersons.

H5 Alternate 2: Average Auditor/Sophisticated Layperson Scepticism Averages

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that the Auditor Scepticism (.924, df 45, p =.006) and Sophisticated Layperson Scepticism (.800, df 52, p <.001) were not normally distributed. As the distributions did not share similar distribution shapes and spreads, a Wilcoxon Ranked Sign Test was utilised.

The results of this test indicate that Scepticism is not significantly different when compared between Auditors and Non-sophisticated Laypersons (T = 473, z = -.257, corrected for one tie, N = 45, p =.797, two tailed). Although Auditors ranked higher (Sum of Ranks = 473), than Sophisticated Laypersons (Sum of Ranks = 517), 51% of the time (N = 45, n = 23) and only one participant ranked equally, Auditor scores

between the 25th and 75th percentiles (.666667 - .880952 range) are clustered similarly to the Sophisticated Laypersons' scores (.642857 - .928571 range).

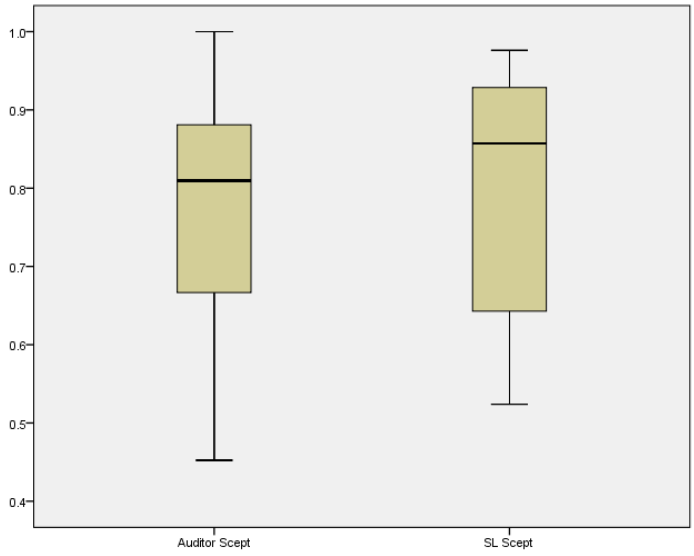
Table 5.14 H5 Alt2 Auditor/SL Scepticism Averages

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
SL Scept	52	.5238	.9762	.778846	.1684470
Auditor Scept	45	.4524	1.0000	.764550	.1537364

Noting that the Y axis of the following figure is truncated at the lower end, the plots illustrate that the majority of Auditor Scepticism scores are accommodated within the same space as the majority of SL Scepticism scores.

Figure 5.19 H5 Alt2 Auditor/SL Scepticism levels



The results of this test do not provide enough evidence to support the alternate hypothesis that Auditor Scepticism is greater than that of Sophisticated Laypersons.

H5 Alternate 3: QFI/Auditor Scepticism Averages

The Shapiro-Wilk statistics and visual inspection of the frequency histograms confirmed that QFI Scepticism (.963, df 41, p = .208) data were normally distributed, but Auditor Scepticism (.924, df 45, p = .006) data were not. As the distributions did not share similar distribution shapes and spreads, a Wilcoxon Ranked Sign Test was utilised.

The results of this test indicate that Scepticism is not significantly different when compared between QFIs and Auditors (T = 297.5, z = -1.059, corrected for 3 ties, N = 41, p = .289, two tailed). Auditors ranked higher (Sum of Ranks = 443.5), than QFIs (Sum of Ranks = 297.5), 54% of the time (N = 41, n= 22), however Auditors' scores between the 25th and 75th percentiles (.666667 - .880952 range) are clustered similarly to the QFIs' scores (.619048 - .833333 range) and 3 participants ranked equally.

This test revealed no significant differences between the average level of Auditor and QFI Scepticism (p = .289).

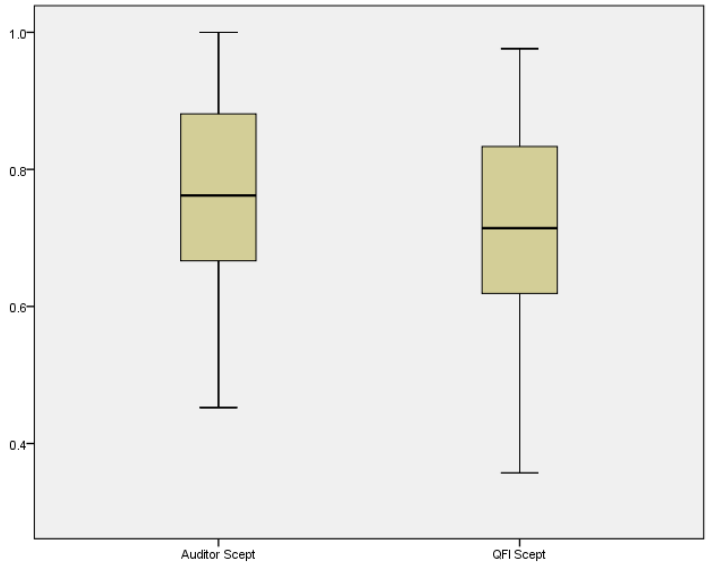
Table 5.15 H5 Alt3 QFI/Auditor Scepticism Averages

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
QFI Scept	41	.3571	.9762	.716609	.1651122
Auditor Scept	45	.4524	1.0000	.764550	.1537364

Noting that the Y axis of the following figure is truncated at the lower end, the plots illustrate that, although the QFI scores accommodate a greater range, the majority of QFI Scepticism scores are accommodated within the same space as the majority of Auditor Scepticism scores.

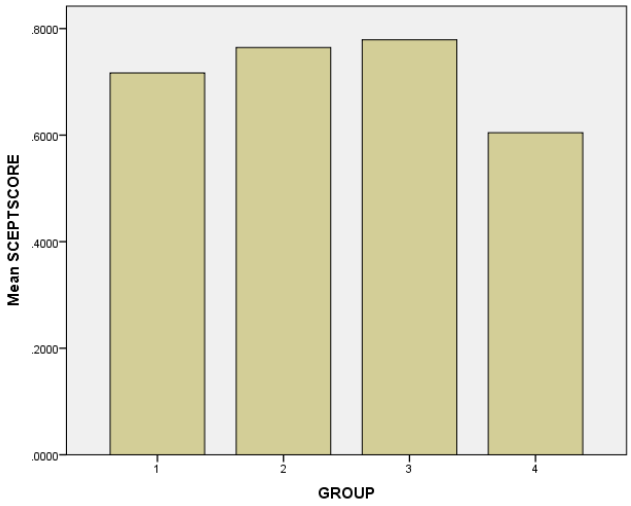
Figure 5.20 H5 Alt3 QFI/Auditor Scepticism Levels



The results of this test do not provide enough evidence to support the alternate hypothesis that, on average, QFI Scepticism is greater than that of Auditors.

Overall for Hypothesis 5, the mean Scepticism scores for the QFI, Auditor and SL groups are reasonably consistent, but NSLs' Scepticism is lower, as illustrated in the following chart.

Figure 5.21 H5 All groups' average Scepticism



From the available data, the difference between groups 2 and 3 (Auditors and SLs) and NSLs, is formal accounting education. QFIs have a sophisticated understanding of accounting for the purposes of fraud investigation, but some may have entered the field via a professional pathway other than formal accounting education.

5.6.4 Professional Scepticism Hypothesis

Hypothesis 6

This hypothesis tests whether Auditors' scepticism meets or exceeds the minimum benchmark of professional scepticism, being 78.2% (.7820) on the Professional Scepticism scale.

A one-sample t-test revealed a non-significant result (sig. = .463, two-tailed), even though the mean Auditor score (.764550) was close to the test value. This means that the *majority* of scores were not close to the value.

This test would not accommodate a *range* or *cut-off point* test value (> 0.7815), so .89 was used to enable exploration of scores within the range between the benchmark and the maximum possible score of 100%. The .89 test value is the mid-

point between 78.2% and 100%. As this value is less than one standard deviation (.1537364) from the minimum benchmark, it was expected that the results would capture the majority of Auditor scores within the relevant range.

The results of this test were significant, as shown in the following table.

Table 5.16 H6 Auditor Scepticism Benchmark

One-Sample Test

	Test Value = .89					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Auditor Scept	-5.474	44	.000	-.1254497	-.171637	-.079262

For a discrete count, the Excel COUNTIF function was utilised to identify the proportion of participant Auditors' Scepticism scores which meet or exceed the lower boundary of professional scepticism.

Of the forty five Auditor participants, twenty three had scores equal to, or greater than, 78.2%, being the lower boundary of Professional Scepticism, established in section *4.8.3 Testing of Hypotheses*. This means that 51.1% of Auditors' scores were in the Professional Scepticism range. Of the remaining Auditor group members', 42.2% of scores (n = 19) were in the Sceptical range, and 6.7% (3) were in the Subjective range.

To simplify comparison, the following table depicts the proportions of all four groups' scores that sit within the three ranges of scepticism, as determined by the Professional Scepticism scale used in this study.

Table 5.17 Scepticism Range Results

	Subjective Range	Sceptical Range	Professional Scepticism Range
Group 1 – QFIs n = 41	12.2% (5)	48.8% (20)	39.0% (16)
Group 2 – Auditors n = 45	6.7% (3)	42.2% (19)	51.1% (23)
Group 3 – Sophisticated Laypersons n = 52	0% (0)	44.2% (23)	55.8% (29)
Group 4 – Non-sophisticated Laypersons n = 153	49% (75)	15.0% (23)	35.9% (55)

5.6.5 Correlations

For completeness, the Scepticism, Skill, Trait and Bias scores of Auditors in each of the Subjective, Sceptical and Professionally Sceptical ranges were explored using Kendall's tau-b to test for nonparametric correlations which may help explain the nature of differences in scores. These tests revealed different results in each of the ranges.

There were too few Auditors in the subjective range (N = 3) to enable meaningful comment.

For Auditors in the sceptical range (N = 19), there were three significant correlations: Kendall's tau-b indicated that the correlation between Scepticism and Trait was

strong and positive, $\tau = .677$, $p < .001$[15], two-tailed. Further, a negative correlation between Scepticism and Bias was quite strong and negative, $\tau = .598$, $p = .001$[1], two-tailed, and there was also a weaker, but significant, negative correlation between Trait and Bias, $\tau = .416$, $p = .019$.

For Auditors in the professional scepticism range (N = 23), only one significant correlation was observed, being a relatively weak negative correlation between Trait and Skill: $\tau = .354$, $p = .033$.

The output of the correlation tests is included at Appendix 7.

5.7 Summary

The steps in this research involved definition of the data set and participant groups, presentation of demographic and descriptive statistics, exploration of the data distributions in preparation for statistical testing, and statistical testing of the hypotheses.

Analyses were conducted by applying statistical tests using SPSS software and the Excel COUNTIF function. The statistical analysis underlying the results is also reported in this chapter. These results are discussed in Chapter 6.

Testing of the data revealed that the primary goals of the study were achieved: A fit for purpose inventory was derived from the composite survey instrument; a 'professional' level of scepticism was determined; and responses from the auditor

[15] Correlation is significant at the 0.01 level (2-tailed).

cluster were compared with the 'professional' benchmark, providing an answer to the primary research question.

Chapter 6: Discussion of Results

6.1 Introduction

This chapter extends the statement of hypotheses in Chapter 4, and the data analysis presented in Chapter 5, by interpreting the results and discussing the implications of the results in terms of the research questions. To that end, this chapter is structured by addressing each of the research questions in turn, with discussion of the relevant hypotheses.

Research Question 1, *Do auditors and other groups exhibit different levels of scepticism?,* includes discussion of Hypotheses 1 through 5, which explore the roles of Bias, Trait and Skill in professional scepticism, and contribute to the establishment of Scepticism Levels. Research Question 2, *Do auditors exhibit professional scepticism?*, involves discussion of Hypothesis 6, which compares Auditors' Scepticism scores with a quantified benchmark of professional scepticism. Within each of those sections, opportunity is taken to connect the findings with the proposed Research Model (Chapter 3), which was constructed from concepts identified in the literature (Chapter 2).

Conclusions about these interpretations of findings are presented in the final chapter, indicating how this study fits within the body of professional scepticism research and showing significance of the research for knowledge in the discipline.

6.2 RQ 1: Do auditors and other groups exhibit different levels of scepticism?

6.2.1 Trait Range

Hypotheses 1 and 2 explored for expected diversity of attitudes across the horizontal Trait axis of the Scepticism Model, which is shown in section *3.6 The Professional Scepticism* Model. The Wrightsman Trust Scale (1991) items were extracted from the main survey inventory, and used for this purpose, relying upon this established scale to explore the reasonableness of the Trait continuum foundation for the subsequent integration of scepticism constructs. Specifically, the null expressions of the hypotheses proposed that Auditors and other participants would be equally biased, whether that be trust-oriented, distrust-oriented, or neutral (H1); and that any such biases are consistent within groups, rather than spread across different ranges (H2).

Hypothesis 1

Alternate 1: Auditor/Layperson Bias

The mean score for auditors is –0.844, indicating that Auditors are neutral on this scale. In contrast, the mean Laypersons score is +7.33, which maps these participants as trusting. This test result was significant ($p = .001$), indicating that there is enough evidence to support the alternate hypothesis that, on average, Auditors are less biased than Laypersons.

The results of H1 testing indicate that the participants were not biased in the same ways. Auditor participants were, on average, significantly less biased ($\mu = -.844$) than all Layperson participants, even despite the off-setting of the moderately distrusting Sophisticated Layperson bias ($\mu = -1.212$) and substantially trusting Non-

sophisticated Layperson bias (μ = 7.373). This result confirms expectations that Laypersons would exhibit diverse (dis)trust biases across the continuum, and that Auditors would exhibit a more neutral position. Indeed, the mean Auditor score diverges only 1.6% (μ = -.844/52, where 52 represents the possible Trust Scale scoring range of -26 to +26) from the point of greatest Neutrality, which is consistent with the ethical requirement for Auditors to be objective (APESB, 2013).

Alternate 2: Auditor/QFI Bias

The mean score for auditors is –0.844, indicating that Auditors are neutral on this scale. In contrast, the mean QFI score is +2.854, indicating a moderate trust bias (d = 0.465). The results of this test were significant (p = .002), indicating that there is enough evidence to support the alternate hypothesis that, on average, Auditors are less biased than QFIs.

Auditors were also, on average, significantly less biased than QFIs. This is consistent with the expectation of Auditor objectivity, as above, and it is consistent with the expectation that QFIs would exhibit a higher level of pre-emptive bias. However, it is noted that the QFI bias is in the opposite direction to expectations. Rather than indicating a small bias toward distrust, consistent with QFIs' workplace predication that fraud has been committed, collating evidence to support prosecution, the mean QFI scores for this sample are in the low *trust* section of the continuum. This result was surprising, but it may be that such trust is off-set by skills which increase scepticism. This possibility is addressed in Hypothesis 4, below.

Recognising that the comparison of means does not address the breadth, or inconsistency, of scores within a possibly broad range, Hypothesis 2 compared the standard deviations of group bias scores to test whether the range of Auditor biases

was relatively consistent. Specifically, the null expression of the hypothesis proposed that Auditor Bias would be no different to that of other groups.

Hypothesis 2

Alternate 1: Auditor/NSL ranges

This test provides evidence in support of H2 Alternate 1 that Auditor Bias (M = -.844, SD = 7.9600) is more consistent than Non-sophisticated Layperson Bias (M = 7.373, SD = 11.2272).

The results of this test were significant ($p < .001$), providing evidence that Auditors have a narrower range of biases than NSLs, around significantly different means, and therefore these groups have very different Bias profiles underlying Traits across different ranges of the Trait continuum.

The results of this test indicated that Auditor biases span a significantly narrower range than those of NSL. Whilst the overall ranges of scores in each group are similar, the majority of Auditor participants' scores cluster tightly around the objective mean. In contrast, the NSL biases span a broad range of the belief-cynicism continuum.

The data indicated strong similarities between the ranges of Auditor and QFI biases though, with no significant difference observed.

Alternate 2: Auditor/QFI ranges

This test does not provide evidence in support of H2 Alternate 2 that Auditor Bias (M = -.844, SD = 7.9600) is more consistent than QFI Bias (M = 2.854, SD = 5.9982).

Although the shapes and ranges of scores are similar, the significantly different means ($p = .018$), suggest that the Bias profiles of these two groups occupy different ranges of the Trait continuum.

The results for this Alternate mean that Auditors have Neutral Traits, whilst QFIs have trusting Traits, but there is not enough evidence to reject the Null hypothesis because both groups' scores are equally consistent.

The results of the Hypothesis 2 test are consistent with the expectations in the Model. Overall, the testing of biases, between groups, has contributed to the continuum aspect of the research Model, by confirming diversity of attitudes across the horizontal axis.

With Bias testing complete, the Wrightsman Trust Scale items were reintegrated into the Scepticism Survey inventory, contributing to the main Skill and Trait factors for the remainder of the hypothesis testing.

6.2.2 Skills

Hypothesis 3 addresses skill, utilised by Auditors when exercising professional scepticism and "critically evaluating the evidence" (AUASB, 2013b) to decrease ambiguity and increase confidence in judgments. This hypothesis explores for 'professional' skill, distinguishable from that which may be exercised by Non-sophisticated Laypersons in particular. For this purpose, the null expression of the hypothesis proposed that Auditors and other participants would be equally skilled, and the Skill factor items were extracted from the data for analysis.

Hypothesis 3

Alternate 1: Auditor/NSL Skill

This test provides evidence to reject the null hypothesis of equal Skill, but there is not enough evidence to support the alternate hypothesis that, on average, Auditors are more skilled than Non-sophisticated Laypersons because the difference was the other way around. This test revealed significant difference between these groups, but the direction of difference was the opposite of expectations. That is, that NSLs' Skill was, on average, significantly ($p = .018$) higher than Auditor Skill.

It was expected that Auditors would exhibit greater skill than Non-sophisticated Laypersons, who were assumed to include many participants with no specialist training or experience to provoke such skill development. The results indicated a significant difference between the Skill of Auditors and NSLs, however that difference was the opposite to expected in that NSLs had greater Skill. In fact, NSLs had the highest mean Skill score (.813259) of all participant groups.

The reason for this is not clear from the data: It is possible that the result is related to sampling, but it may also reflect that Laypersons, without access to the resources available to Auditors (regulations, Standards, methods) which support critical evaluation, may independently develop more overt Skill systems to compensate for perceived insufficiency of information. Alternately, it may be that the types of Skill exhibited by Laypersons are more effectively captured by the research instrument than those exhibited by Auditors. This may be a consequence of utilising a generic scale to measure both generic and specialist skill sets, which may be clarified by further research. This apparently counter-intuitive finding is, however, reflective of a finding by Khan & Harding (2013, p.1) that:

Rather than being positively associated with state skepticism, trait skepticism was negatively associated with the level of skepticism reflected in evidence evaluation and the judgments made in light of that evidence. That is, higher levels of trait skepticism were associated with lower levels of state skepticism.

This result was also opposite to expectations, but the interactions between Trait scepticism and evidence evaluation may involve a trade-off adjustment wherein a misguided high trait factor inadvertently creates low-scepticism judgments (Khan & Harding, 2013). In the case of this particular hypothesis, it is also possible that high level skills are necessary to offset the low Trait scores, which span across almost the entire continuum, with the minimum (7%) significantly lower than the next low group minimum (39%).

Alternate 2: Auditor/QFI Skill

This test indicates there is not enough evidence to support the alternate hypothesis that, on average, Auditors are less skilled than QFIs. However, overall, the Null hypothesis is rejected by virtue of Non-sophisticated Laypersons being more skilled than Auditors in the first Alternate.

The second alternate hypothesis predicted that Auditors would exhibit relatively lesser skill than QFIs, whose work involves a standard of court-admissible evidence which is higher than that to achieve reasonable assurance. Therefore QFIs were expected to exhibit the highest level of skill. However, the results of this test were not significant, and did not provide evidence that the skills of Auditors and QFIs are statistically different. One possible reason for this could be that Auditors and QFIs share a similar skill set for the purpose of evaluating evidence.

Overall, testing of the Skill hypotheses has contributed to the research Model by offering support for the notion of a variable Skill factor, however at this stage it is

not clear how this factor is to be understood, because the results were different to expectations.

6.2.3 Scepticism Levels

Hypothesis 4 is the first step in addressing the notion of scepticism levels. Specifically, this hypothesis explores whether the Scepticism scores for each group cluster into distinguishable ranges, which are different between groups. The null expression of the hypothesis is, therefore, that there are no significant differences.

For this purpose, the Trait and Skill factor items were combined to derive an overall Scepticism score for each participant. The standard deviations of each group's scores were the focus of this analysis, with smaller standard deviations representing tighter clustering of scores. It was expected that QFI and Auditor groups would have more distinct ranges than NSLs. Comparisons were also made between the QFI and Auditor ranges, and between the SL and NSL ranges.

Hypothesis 4

Alternate 1: QFI Range Differentiation

This test provides evidence in support of Alternate 1 that QFI Scepticism (M = .716609, SD = .1651122) is more consistent than Non-sophisticated Layperson Scepticism (M = .604420, SD =.2860812).

The first alternate hypothesis predicted that the QFI Scepticism range would be smaller than that of NSLs. The results were significant and provided evidence to support the alternate hypothesis. This means that a QFI range was clearly distinguishable from the broader NSL range.

Alternate 2: Auditor Range Differentiation

This test provides evidence in support of Alternate 2 that Auditor Scepticism (M = .764550, SD = .1537364) is more consistent than Non-sophisticated Layperson Scepticism (M = .604420, SD = .2860812).

The second alternate hypothesis predicted that the Auditor Scepticism range would be smaller than that of NSLs. Again, the results were significant and provided evidence to support the alternate hypothesis, meaning that an Auditor range was clearly distinguishable from the broader NSL range.

Alternate 3: Differentiated QFI & Auditor Ranges

This test provides not provide enough evidence to support Alternate 3 that QFI Scepticism (M = .716609, SD = .1651122) is more consistent than Auditor Scepticism (M = .764550, SD = .1537364).

The third alternate hypothesis predicted that the QFI Scepticism range would be smaller than that of Auditors. These results were not significant and did not provide evidence to support the alternate hypothesis. An Auditor range was not clearly distinguishable from the QFI range. Given that the QFI group was studied for the purpose of representing a very high level of scepticism, and that professional scepticism is a requirement of Auditors, this result provides evidence that the majority of Auditors share the same range of scepticism as the majority of QFIs. Such a result is a positive indicator for this research.

Alternate 4: Differentiated SL & NSL Ranges

This test provides evidence in support of Alternate 4 that Sophisticated Layperson Scepticism (M = .778846, SD = .1684470) is more consistent than Non-sophisticated Layperson Scepticism (M = .604420, SD =.2860812).

The fourth alternate hypothesis predicted that the SL Scepticism range would be smaller than that of NSLs. The results were significant and provided evidence to support the alternate hypothesis, meaning that an SL range was clearly distinguishable from the broader NSL range.

Overall, the tests in this section provide evidence to reject the Null that there is no difference between the ranges of Scepticism, when compared between groups. The alternative hypotheses were supported in three cases, wherein the scepticism scores of QFIs, Auditors, and SLs all clustered significantly better than those of NSLs. The ranking of these ranges, and the observed similarity between QFIs and Auditors, were explored further in testing of the final two hypotheses.

Hypothesis 5 is the second step in addressing the notion of scepticism levels. Specifically, this hypothesis explores whether the Scepticism scores for each group centre on means which are different between groups, for the purpose of defining a professional level of scepticism. The null expression of the hypothesis is, therefore, that there are no significant differences. The alternate hypotheses propose that, in turn, SL Scepticism would be greater than NSL Scepticism; Auditor Scepticism will be greater than SL Scepticism; and QFI Scepticism would be greater than Auditor Scepticism.

Hypothesis 5

Alternate 1: SL/NSL Scepticism Averages

This test indicates there is enough evidence to support the alternate hypothesis that, on average, Sophisticated Laypersons are more sceptical than Non-Sophisticated Laypersons.

Starting with the broadest range, the first alternative compared the mean SL Scepticism with mean NSL Scepticism. The results were significant and provide enough evidence to support the alternate hypothesis that SLs have greater Scepticism. In light of the results of testing Hypothesis 4, the evidence supports a level of SL Scepticism which is clearly distinct from, and higher than, NSL scepticism.

Alternate 2: Auditor/Sophisticated Layperson Scepticism Averages

This test revealed no significant differences between the average level of Auditor and SL Scepticism ($p = .797$), and do not provide enough evidence to support the alternate hypothesis that Auditor Scepticism is greater than that of Sophisticated Laypersons.

The second alternative compared the mean Auditor Scepticism with mean SL Scepticism. The results of this test revealed no significant difference between Auditor and SL Scepticism. Therefore different levels are not identified between these two groups. It may be that this result could be different for larger sample sizes, but given that the SL group includes trained accountants and other professionals, and that the Skill and Trait scores for distrusting SLs were both very high, it may be that the participants in these groups are, on average, equally Sceptical.

Alternate 3: QFI/Auditor Scepticism Averages

The results of this test do not provide enough evidence to support the alternate hypothesis that, on average, QFI Scepticism is greater than that of Auditors.

The third alternative compared the mean QFI Scepticism with mean Auditor Scepticism. The results revealed no significant difference between these groups, and therefore separate levels are not identified.

Overall, these tests establish that QFIs, Auditors and SLs are more sceptical than NSLs, and the Null hypothesis is rejected. Further, the results of testing Hypothesis 4 revealed that the scepticism scores of QFIs, Auditors, and SLs all clustered significantly better than those of NSLs. This means that there are at least two distinct levels of scepticism identified by the statistical testing, and that the lower level pertains to the NSL group, as expected.

It was possible that testing of larger QFI, Auditor and SL samples would reveal more substantial differences between these groups, and that alternative testing methods may be more informative. Indeed, the Wilcoxon Signed Ranks Test identified that the scores clustered similarly between the 25^{th} and 75^{th} percentiles, but did not address the extremities of the samples.

This situation was explored further by deriving a benchmark of professional scepticism from the raw QFI Scepticism scores. The method for that procedure was explained in Chapter 4: Method, in section *4.8.3 Testing of Hypotheses*. All participants scores can be compared with that benchmark to determine the proportions of each group that are equal to, or greater than, the benchmark, indicating scepticism within the professional range. This is addressed in the following section.

6.3 RQ2: Do auditors exhibit professional scepticism?

Hypothesis 6 predicted that Auditor Scepticism would be equal to, or greater than, 78.2%, which is the lower boundary of professional scepticism as defined in section 4.8.3. The second range identified in testing of Hypothesis 5 was split at the fiftieth percentile, recognising that point at which judgments are balanced between evidence consideration and subjective bias. This split resulted in a mid-range, spanning the difference between the fiftieth percentile and the professional scepticism benchmark, and encompassing judgments which are, on balance, more evidence based than subjective, but does not involve evidence to the extent of professional scepticism. The range below fifty percent was considered to be the subjective range, encompassing those judgments which are based more upon subjectivity than evidence evaluation.

Auditor Scepticism scores which met the benchmark were counted, and it was found that 51.1% (N = 45, n = 23) fell within the professionally sceptical range. A further 40% were sceptical, and 6.7% exhibited indicators of subjectivity. This means that a slim majority of Auditors do exhibit indicators of professional scepticism.

To further understand the diversity of Auditors' Scepticism scores, they were further analysed to search for correlations with the Trait and Skill sub-scores, and with the (dis)trust nature of their Trait biases. Each of the results was quite different.

For Auditors in the professional scepticism range, a weak negative correlation was observed, between Trait and Skill. This is consistent with the findings from Hypotheses 4 and 5 which found that Trait was more influential than Skill in trusting Auditors, but there was no difference in distrusting Auditors. In both cases though, the Trait and Skill scores were high, and it was suggested that the relative weightings

of Trait and Skill may not be important when both are high. Two Auditors, however, achieved perfect Scepticism scores by achieving perfect Trait and Skill scores. This suggests that 4% (2/45) of Auditor participants might present an inefficiency risk in the workplace, and that percentage may increase if other high-performing Auditors utilise greater scepticism than is warranted by the circumstances.

For Auditors in the sceptical range, there were three correlations. A strong positive correlation between Scepticism and Trait means that, for these Auditors, Scepticism is largely driven by their Trait positions. In addition, a quite strong negative correlation between Scepticism and Bias means that the Auditors at the top of this range are less biased than those at the lower end of the range. Finally, a weak but significant negative correlation between Trait and Bias corroborates that the dominant Trait factor is not compromised by bias at the top of the sceptical range. Auditor attitudes in this range may increase Audit Risk if they are not able to utilise sufficient scepticism to suit workplace circumstances. This risk would increase toward the lower end of the scepticism range.

For Auditors in the subjective range, there were two perfect negative correlations: Firstly, the relationship between Scepticism and Bias means that the least sceptical Auditors are also those who are the most biased. However, only three Auditors scored in this range, and they were all above 45%. Although the testing of Hypothesis 1 revealed that Auditors are, on average, the least biased of the participants in this study, the Auditors in this range exhibited low levels of Skill (> 50%) and Traits influenced by strong trust biases, which is corroborated by a perfect negative correlation between Traits and Skills. Auditor attitudes in this range increase Audit Risk enormously due to judgments that are more subjective than evidence based. Such judgments are also clearly inconsistent with the requirements in the Auditing Standards.

To complete testing, all the remaining participants' Scepticism scores were then allocated to the ranges, and it was revealed that the challenge of attempting to distinguish an exemplary QFI level of scepticism during testing of Hypothesis 5 arose because only 39% of QFIs exhibit indicators of professional scepticism. This is a reflection of the method used to derive the benchmark, which was calculated using raw Scepticism scores before they were converted to percentages for analysis. This means that the benchmark was not compromised by where QFI Scepticism clustered on the scale, and therefore it appropriately accommodated the fact that no QFIs had perfect Scepticism scores.

In the meantime, it was noted that approximately half of NSL participants are more subjective than sceptical, which is consistent with the expectations of this analysis and the research Model. To simplify comparison between groups, the following table depicts the proportions of all four groups' scores that sit within the three ranges of scepticism, as determined by the Professional Scepticism scale used in this study.

Table 6.1 Overview of Scepticism Range Results

	Subjective Range	Sceptical Range	Professional Scepticism Range
Group 1 – QFIs n = 41	12.2% (5)	48.8% (20)	39.0% (16)
Group 2 – Auditors n = 45	6.7% (3)	42.2% (19)	51.1% (23)
Group 3 – SLs n = 52	0% (0)	44.2% (23)	55.8% (29)
Group 4 – NSLs n = 153	49% (75)	15.0% (23)	35.9% (55)

6.4 Summary

The findings of this research are generally consistent with expectations in that all Null hypotheses were rejected by at least one of the Alternate tests. However, the results did not provide enough evidence to support the Alternates in all these cases. Specifically, both Alternate tests of Hypothesis 3 returned one-tailed results which were in the opposite direction to expectations. This could be an implication arising from small sample sizes, or it is possibly a realistic result that could be clarified by further research into the roles of scepticism Traits and Skills.

The results are promising in that, if the scale can be developed into a reliable means of measuring scepticism, auditors, audit firms and educators may be empowered to leverage the inherent Trait position with training which is targeted to individuals' needs. Further, such a development introduces scope for academic research into the potential of targeted training to improve scepticism states, as and when required, for the purpose of reducing audit risk, and potential auditor liability arising from audit failure.

The findings also reveal that further research of the Trait and Skill roles may be of value to further the understanding of scepticism; its underlying Trait platform, and the potential influences of Skill development and utilisation to achieve a greater overall sceptical state.

Chapter 7: Conclusions

7.1 Introduction

All auditors are specifically required by audit regulation to exercise 'professional scepticism' throughout the external audit process (AUASB, 2013b). However, according to Beasley, Carcello and Hermanson (2001), lack of professional scepticism is one of the most common audit deficiencies, along with lack of due care and failure to collate sufficient evidence of sufficient quality. These problems are arguably interrelated, as this research has attempted to demonstrate.

Review of the literature revealed a growing body of professional and academic papers describe a need to improve professional scepticism. This indicates that scepticism, as a concept, is a continuum. To understand the nature and extent of improvement required it is necessary to first understand what auditors' professional scepticism currently looks like. Scepticism involves "ongoing questioning" (AUASB, 2013a, para. A7), and provides additional guidance material that describes acts which constitute *increased* professional scepticism (AUASB, 2013a, para. A33). However, the guidance materials are consistently qualified by need to exercise judgement in determining what an appropriate level of scepticism is (AUASB, 2013a, paras A7-A9), with terms such as "where relevant" (AUASB, 2013a, para. A7). The standard implies that there are levels of scepticism which can be applied. There is also no currently available means of measuring professional scepticism for the purpose of identifying or quantifying any need for improvement. The purpose of this research was to address that measurement gap.

This chapter begins by reviewing the study's aims and stating the conclusions derived from the research. The contributions to knowledge are then outlined, and the implications for education and the profession are discussed. Limitations of this research are then acknowledged, and opportunities for further research are suggested.

7.2 Review of the study

7.2.1 Aims of the research

My primary objective is to explore whether or not auditors exhibit indicators of professional scepticism. Measuring this may be helpful in establishing how much improvement is necessary for the purposes of complying with the Auditing Standards. Therefore, not only is measuring levels of scepticism important, there is a need to develop a suitable standard for the level of scepticism. Therefore, the goals of this research were to address the following two overarching research questions:

RQ 1: Do auditors and other groups exhibit different levels of scepticism?
and
RQ 2: Do auditors exhibit professional scepticism?

In order to achieve these goals, it was first necessary to explore how professional scepticism might be differentiated from a non-professional, or lay, form of scepticism, and to then determine means of applying such differentiation in a way that would enable measurement of individuals' scepticism attitudes. The method most appropriate to this involved use of Attitude scales.

It is possible to convert results from the Hurtt (2009, 2010) Scale to percentages, which would allow a benchmark standard (upper quartile or other measure) which could therefore be compared to a benchmark for this purpose. However, that scale

accommodates only the Trait factor (Hurtt, 2009). It was therefore decided that an approach which extends the work of Hurtt (2010, 2013), which in turn draws upon Nelson's (2009) concept of Neutrality, could involve measurement that also encompassed the continuum concept, following the work of Glover & Prawitt (2014).

Therefore, a new scale was explored, by combining three existing sub-scales, which potentially applied to the continuum by measuring attitudes related to the notions of trust (Wrightsman's Trust Scale, 1991), ambiguity (Intolerance of Ambiguity Scale, Budman, 1962) and curiosity (The Curiosity and Exploration Inventory-II, Kashdan et al, 2009). Wrightsman's Trust scale was preferred to Hurtt's scale because Wrightsman's is a bilateral scale, encompassing trust and distrust, and matched the structure of Glover & Prawitt's (2014) continuum. The use of a bilateral scale would allow the mid-point to be neutral; a balance of distrust and trust. It has also been used in prior audit studies (EG: Rose, Rose & Dibben, 2010). It was proposed that the Intolerance of Ambiguity and Curiosity scales may capture the Skill factor as it pertains to questioning and critical analysis of audit evidence.

Analysis of the data suggested that a combination of the Trust and Intolerance of Ambiguity scales would measure Trait and Skill, and a new 17-item inventory was derived, with a Cronbach's Alpha of .910 and two confirmed factors which explain 62.638% of the variances.

Extending the existing notion of levels of scepticism (Harding & Trotman, 2015; Glover & Prawitt, 2014; Westermann et al, 2014; Hurtt, 2013), benchmarks were then determined. The benchmark setting the lower boundary of professional scepticism was derived from data belonging to Qualified Fraud Investigators (QFIs). This group was chosen to set the benchmark because of the very high quality of

evidence required for prosecution of fraud cases, and because fraud-related investigation necessitates high-level analytical skills due to the deceptive and hidden nature of the evidence, exemplifying evidence-based judgment. The benchmark separating the lay scepticism range from the subjective range was set at the mid-score of 50%, recognising a point of balance between subjective attitudes and those which begin to accommodate more evidence than subjectivity.

Audit participants' scores, derived from the new Scepticism Scale instrument, were then compared with the benchmarks to observe whether a professional level of scepticism was indicated.

Overall, the aims of the research were achieved, in that a professional level of scepticism was derivable from the data for the purposes of this study; and it was therefore possible to answer the question of whether auditors in the study exhibited indicators of professional scepticism as measured by this research.

7.2.2 Conclusions Derived from Hypothesis Testing

The results of testing hypotheses in relation to Research Question 1 indicate that some groups of people do exhibit levels of scepticism which differ from other groups. The data suggests that formal accounting education may be a driver of the differences observed in this research, because although Auditors do exhibit a different level of scepticism to Non-sophisticated Laypersons, the Auditors and other sophisticated users of accounting information share similar overall scepticism level characteristics.

In terms of Research Question 2, the research found that 51.1% of the Auditors in this study did exhibit indicators of professional scepticism. A further 40% were sceptical, and 6.7% appeared to have more subjective than evidence-based attitudes

to judgment. However, whilst the proportion of professionally sceptical auditors appears lower than may be expected, it is important to recognise that this scale measures scepticism in terms of a default attitude, or a base-line, meaning that scores may increase substantially in response to perceived risk (Brown-Liburd, Cohen & Trompeter, 2013; Quadackers et al, 2009), and in response to prompts (Khan & Harding, 2013; Grenier, 2014). In this sense, the Scepticism Scale utilised in this study measures only a minimum level of scepticism for each participant, and actual capacity may be far greater than the current data indicates. This presents an opportunity for future experimental research in an audit-specific context, measuring the incremental changes achievable by introducing workplace-relevant cues to heighten scepticism.

Exploration of the Trait and Skill sub-scale attributes of participants in each of these levels revealed clear differences. Whilst Trait appeared to be very influential at all levels, the professionally sceptical auditors were not significantly biased, and Skills were consistently high for these participants. Whilst it is possible that some Auditors who score in this range may be considered inefficient when risk is low, they are unlikely to need external prompts to increase scepticism when necessary, which is conducive to lowering Audit Risk. As the risk of issuing an inappropriate opinion is of greater consequence than inefficiency, the extremely high scores achieved by some auditors may be valued in the workplace.

In contrast, Auditors in the (mid) sceptical range were strongly influenced by their trait factor, and biases became very influential toward the lower end of the range. There was a negative correlation between Trait and Skill, but the relationship was not significant, indicating that skills may be able to counteract low-scepticism traits in this range. This pattern is similar to non-sophisticated layperson who exhibited trusting characteristics. This means that auditors who scored in this range may have

difficulty utilising skills to increase scepticism in response to risk or external prompts in the workplace, which may increase audit risk. A large proportion of this study's auditor participants scored in this range, suggesting that skill development activities may be important; particularly for those with trust-related biases which need to be offset.

The major themes to emerge from these findings are that scepticism-related Traits and Skills behave differently in individuals with different levels of overall Scepticism, and that biases do not appear to present a barrier to Skill development.

7.3 Contributions to Knowledge

Professional scepticism is one of the most important auditing constructs (Hurtt 2010; Hurtt et al. 2013; Cohen et al, 2014). This study's approach represents a development of expanding awareness of the issues involved. It is expected to contribute knowledge to audit research in terms of initiating methodology debate, and enabling more specific future research of this elusive, but important, subject matter.

In the following sub-sections, two main contributions are described.

7.3.1 A Composite Model of Professional Scepticism

This model draws together concepts in the extant literature to explore the interactions between core antecedents to professional scepticism. Seminal influences include Hurtt's (2010) measurement of the Trait factor, Grenier's (2014) discussion of experiences and overconfidence that present barriers to scepticism, Nelson's (2009) concept of Neutrality, and the Trait continuum presented by Glover & Prawitt (2014).

Prior research acknowledges that a professionally sceptical state is distinguishable from a default scepticism mindframe, as indicated by measurement of Auditors' inherent scepticism trait (Castro, 2013) and acknowledgment that other factors may influence how scepticism manifests (Nelson, 2009) in varying circumstances. This research combines the above concepts to describe the interaction of scepticism-related Trait with Skills to measure a default state of scepticism, which may be incremented by developing or initiating use of skills for the purpose of achieving a heightened level of scepticism in response to assessed risk or prompts.

The model prepared during this research extends the work of Hurtt (2010, 2013), draws upon Nelson's (2009) concepts of Neutrality and trade-offs between scepticism antecedents. It also develops the continuum concept, introduced to study of scepticism by Glover & Prawitt (2014), and extends the work of Hurtt (2010) by accommodating the Skill factor, as a means of explaining the difference between a scepticism Trait and an overall scepticism state. This research proposes that whilst the Trait factor relates to the "enquiring mind" aspect of the International Auditing Standard definition of professional scepticism (PCAOB, 2012b; AUASB, 2013b), the Skill factor is an essential complement, relating to the "critical evaluation of the evidence" aspect in that same definition.

During the course of this research, Cohen et al (2014) published a study with a similar approach in that they measured levels of scepticism, and combined their neutral measure of scepticism with a presumptive doubt measure of scepticism. The approach is consistent with this study in that the authors categorise their auditor participants in to groups according to their scepticism scores before exploring for overall trait characteristics. Cohen et al's (2014) work also built upon Nelson's (2009) model and the work of Hurtt et al (2013) categorize the antecedents to

scepticism, and is consistent in that these antecedents were categorised as two internal characteristics (Trait and Skill) plus two categories of external factors which represented risk, or prompts.

Interestingly, Cohen et al (2014) use both the Hurtt Scale (2010) to measure a neutral perspective of professional scepticism, and the Wrightsman Trust Scale (1991) to measure a presumptive doubt perspective. A negative correlation between the two was anticipated, but there was no significant correlation. My research model may complement Cohen's (2014) results by explaining that when Wrightsman's (1991) bilateral scoring method is adapted to accommodate a neutral mid-point, it is able to accommodate both presumptive doubt (low negative scores on the distrust side of the continuum) and neutrality (scores at or close to zero on either side of the continuum).

7.3.2 Professional Scepticism Scale

The Scepticism Scale devised during the course of this research is presented as a stand-alone instrument which may progress understanding of auditor scepticism and may provoke discussion by academics, regulators and the profession. Whilst prior studies have measured auditor scepticism relative to other auditors, the literature does not reveal prior application of discrete scoring systems to auditor scepticism; or comparison of such a measure with a 'professional' level of scepticism.

This scale potentially offers two contributions to knowledge of professional scepticism: Firstly, quantification of the factor sub-scales and overall scepticism scores should facilitate research into the relationships between these factors, to further develop our understanding of the antecedents of professional scepticism. Secondly, quantification should facilitate comparison between research projects which use the composite scale and its scoring method. This second contribution is

my major contribution, and is offered as a platform to launch debate and development.

7.4 Implications of the study

7.4.1 Implications for Research

The Scepticism Scale arising from this study may be a helpful tool for exploration of means by which scepticism can be improved. Previous studies identify barriers to professional scepticism, and others identify prompts which facilitate it. My scale may provide means of simplifying research which entails measuring the effects of barriers and facilitators. For example, capacity to isolate and quantify changes in skill may enable ranking of facilitators to match those which are most appropriate to certain circumstances; such as when a participant's results indicate a high scepticism Trait but low Skill, versus moderate scepticism Trait and moderate Skill.

Examples of types of facilitators which might involve long-term effects, and thus influence the Trait factor, include Gilovich's (1991) suggestion that instruction in, and experience with, scientific method increases scepticism skill, and Rose's (2007) finding that fraud-related experiences are helpful for improving fraud detection capability. In contrast, other facilitators might involve shorter-term effects, and thus influence the Skills factor. These include external prompts which cue activation of scepticism skills and internal prompts to recognise context-specific risks.

Further, the scale may provide a consistent means to measure the effects of differing remedies under experiment conditions, with the quantifiable results easing the problems associated with using different participant cohorts, or testing the different remedies at separate times.

7.4.2 Implications for the Profession

The Scepticism Scale includes capacity to indicate the nature of improvements which are best matched to the needs of specific individuals. This capacity is not, of itself, an original contribution derived from this research. However, this study applied the Wrightsman Trust Scale (1991) in a novel way, which contributes further to address the measurement gap between the Auditing Standards and calls for improved professional scepticism.

That is, individuals' results from the Wrightsman Trust Scale (1991) items, extracted from the Professional Scepticism Scale, have been used to indicate the nature of the underlying scepticism Traits, in terms of whether they are trusting, distrusting, or neutral, represented by the symbols +, - or 0 respectively. A degree of bias (in the range 0 – 26[16]) is also available. For the purposes of this study, this was referred to as the Bias indicator. If an individual's overall Scepticism is not in the professionally sceptical range, the Bias indicator may be useful to guide choices of training or professional development activity types which are most relevant to the nature and extent of the Bias.

Hurtt et al (2013) note that some research has called for audit firms to screen (prospective) audit staff for scepticism qualities (for example, Farag and Elias 2012, in Hurtt et al 2013). This research cautions against such testing because no measurement tool has, as yet, been established as a universally reliable mechanism for measuring auditors' professional scepticism, with reiterative validity, and accommodating all factors of professional scepticism. Therefore, it is potentially very problematic if scepticism measurement tools were used as a pre-employment evaluation of vocational fit.

[16] Scoring method adapted from a 7-point to a 5-point likert scale, with a neutral centre point, and a revised possible scoring range of +/- 26.

However, as there is potential for scepticism skills to be learned and counteract the effects of sub-optimal trait scepticism, as shown in this research, it may be possible for the Scale to be utilised by audit firms to assess the training needs of staff in terms of skill needs. Where relevant, additional training could be offered to those with lower Trait and/or Skill scores; however it must be noted that ongoing professional development is still necessary for all staff, because all skills require maintenance (Bandura, 1993) lest they be gradually lost over time to counter-productive clean-audit experiences and/or myriad other barriers. It must also be remembered that firm culture, processes and supervision arrangements have been shown to influence the manifestation of scepticism (Hurtt et al, 2013; Svanström, 2015; Nelson 2009; PCAOB 2012a; Hurtt et al. 2013; Westermann et al, 2014; Vera-Muñoz, 2015), and therefore firms must remain cognisant of the impact that their workplaces may have on auditors' professional scepticism in practice, and in differing circumstances.

7.5 Limitations

7.5.1 Scope – Purpose of the Scepticism Scale

It is important to recognise that the purpose of the Scepticism Scale derived for the purpose of this research was to measure an indication of participants' default scepticism mindframe. That is, to obtain a picture of attitudes which are the default mindframe in the absence of any risk cues or external prompts which cause an individual auditor to utilise skills to achieve a heightened sceptical state (Castro, 2013). As no such cues or prompts were included in the survey instrument, the scores derived from this research reflect the minimum scepticism for each participant at the time of participating in the research. Therefore the scores derived from the instrument must not be assumed to represent a participant's maximum capacity. It is possible that individuals who score in the (moderate) scepticism range may be able to

respond to prompts in the workplace which increase their overall scepticism to high in the professional scepticism range. Such a possibility provides scope for further research, as described below.

Conversely, a high scepticism score could also be misinterpreted. On the one hand, it may be seen as positive, meaning likely to be highly sceptical throughout every audit, thus complying with the regulatory requirement and lowering Audit Risk. It may also be viewed as negative, meaning a tendency to inefficiently over-audit (Hurtt et al, 2013) at all times, rather than in response to assessed risk.

From the opposite perspective, it is not expected that those who are highly sceptical in specific workplace contexts would transfer sceptical attitudes to social and other supportive contexts, such as participation in research projects, which involve lower risk and demand less rigorous reasoning. Further, trust is a positive characteristic in supportive social engagement, and can even be beneficial in audit firms (Rose, Rose & Dibben, 2010) so it is possible that the trust biases exhibited in the context of data collection for this research may be reflective of the low-risk context. It is possible that the trust effects in this study could be reduced in an audit context, and especially risky audit contexts, at least to the extent that the Trait position would allow.

This means that the Scepticism Scale does not provide a measure of scepticism as it applies to any audit context, and therefore it is not appropriate for use as an indicator of vocational fit or potential. Cohen et al (2014, p.5) further emphasise that auditors in their study with the greatest scepticism were not the best hires in terms of job fit, loyalty and retention, underlining that further research is necessary before such an application should be considered.

7.5.2 Scope – Sampling

The results of this research must be read with the caveat that the results are limited to the participants of this study and cannot be extrapolated to the broader population. Further research, involving a much larger sample, is warranted to improve the generalisability of the findings.

7.5.3 Instrument Development

Compilation of a psychometric tool was not an original goal of this research: Rather, need to do so arose from the specific requirements of the research question, which demanded not only that a 'professional' level of scepticism be specified, but that scepticism be measured. As no appropriate tool was found to exist for that purpose, the tool was constructed. Although the instrument is found to possess high internal validity and the two dimensions sought, further development of the scale, and a much larger sample size, is necessary to account for errors in projection.

Whilst it was possible to identify item response models that would accommodate non-normally distributed data, it was more challenging to identify a model that would also accommodate data that is not unidimensional (Preston & Reise, 2013). Preston and Reise (2013) recommend use of procedures to reduce the error consequences of ignoring non-normality, exacerbated by skewed distributions and small sample sizes. Such analysis requires a level of statistical and psychometric expertise that is beyond the scope of this particular study. However, suggestions for future research to improve generalisability and simplified application are included in the Future Research Opportunities section of this chapter.

7.6 Future Research Opportunities

Several opportunities for future research arise from this study, mostly in the field of scale development. Some of those ideas are listed below.

7.6.1 Further scale development

Further development of the scale would simplify future application for research or training purposes. When the number of participants who complete the Professional Scepticism survey increase substantially, the database may eventually become more reflective of the average English speaking adult population, allowing for statistical refinement. However, the distinct differences in shapes of the Skill distributions between the professional and non-sophisticated participant groups are not expected to converge or to normalise because professional participants' are required to have high level skills. Further, given the social favour afforded to trust-oriented Traits, the overall Trait distribution is not expected to normalise.

Standardisation of variables may elucidate differences between sophisticated and non-sophisticated participant groups and provide for a more generalisable method of utilising the scale. In particular, standardisation of the sub-test scores for each dimension may increase understanding of the two identified factors by facilitating comparison, per respondent, between sub-tests.

In addition, it could be useful to apply Item Response Theory to the polytomous response data to achieve a greater understanding of latent traits underlying individuals' scepticism scores (Templin, 2007). By applying Samejima's (1969) Graded Response Model to subjects' scepticism and bias scores (Templin, 2007), we may further understand the relationship between the trait and skill aspects of professional scepticism.

Finally, Peytcheva (2014) and Quadackers et al (2014) suggest that it may be possible to determine whether an instrument reflects an optimal level of scepticism by comparing results of an experiment with a normative solution, and evaluating outcomes in light of participants' scepticisms scores. To that end, after further development, this scale might be tested, and the results compared with Peytcheva's (2014) findings.

These developments may facilitate scoring of individual subjects, by educators and trainers for example, who could compare subjects' standardised total and sub-scores with representative base means and standard deviations, without need to administer the instrument to large numbers of subjects in future studies.

7.6.2 Audit-Specific Trait & Skill Interactions

Peytcheva (2014) highlighted that more must be understood about the relative importance of trait versus state scepticism when constructing an overall measure of scepticism.

Future studies which explore the underlying constructs that underlie the trait and skill factors of scepticism may shed light on how skills work to achieve a heightened sceptical state. Introduction of constructs such as conscientiousness (and other situational variables), and subsequent evaluation of the scale using Item Response Theory may reveal how the Scale may be useful in different audit scenarios. If so, situational differences may be included in the instrument, and the measures must be evaluated independently, perhaps against prior studies, and in the context of each other.

References

Abernethy, M., 2005, 'The Crooked End of Town, *Charter*, ICAA, 76(7), pp. 30-33.

Accounting and Corporate Regulatory Authority (ACRA), 2013, *Practice Monitoring Program: Seventh Public Report*, http://www.acra.gov.sg/uploadedFiles/Content/Publications/Reports/2013_07_30_PMPReport2013Clean.pdf, accessed 20/11/15.

Accounting Professional and Ethical Standards Board (APESB), 2013, *APES 110: Code of Ethics for Professional Accountants*, http://www.apesb.org.au/uploads/standards/apesb_standards/compiledt2.pdf, accessed 26/7/16.

Allen, G., 2006, 'The HIH Collapse: A costly catalyst for reform', *Deakin Law Review*, 11(2), pp. 137-159.

Allen, P. & Bennett, K., 2012, *SPSS Statistics: A Practical Guide (Version 20)*, Cengage Learning Australia Pty Ltd: Melbourne.

ALMR, 2014, *Undetected fraud a growing burden on business*, ALMR, http://www.almr.org.uk/undetected-fraud-growing-burden-business/, accessed 20/11/15.

American Psychological Association (APA), 2014, *The Standards for Educational and Psychological Assessment*, http://www.apa.org/science/programs/testing/standards.aspx#overview, accessed 21/5/14.

Anderson, C., 2009, 'A Viewpoint: Common sense and belief formation', *Management Decision*, 47(3), pp. 383-391.

Arnold, V., Collier, P.A., Leech, S.A. & Sutton, S.G., 2000, 'The effect of experience and complexity on order and recency bias in decision making by professional accountants', *Accounting & Finance*, Vol. 40(2), pp. 109 – 134.

Asare, S.K. & Wright, A.M., 2004, 'The Effectiveness of Alternative Risk Assessment and Program Planning Tools in a Fraud Setting', *Contemporary Accounting Research*, 21(2), pp. 325-352.

Association of British Insurers, 2015, *UK Insurance & Long Term Savings Key Facts 2015*, https://www.abi.org.uk/~/media/Files/Documents/Publications/Public/2015/Statistics/Key%20Facts%202015.pdf, accessed 20/11/15.

Association of Certified Fraud Examiners (ACFE), 2005a, *Demand for Fraud Examiners Rises as Organisations Build Anti-Fraud Expertise*, Association of Certified Fraud Examiners, February 2, http://www.cfenet.com/press/releases/2005_02_02.asp, accessed 15/10/05.

Association of Certified Fraud Examiners (ACFE), 2006, *Report to the Nation on Occupational Fraud and Abuse*, Association of Certified Fraud Examiners, http://www.acfe.com/documents/2006-rttn.pdf, accessed 25/2/07.

Association of Certified Fraud Examiners (ACFE), 2007a, *Encyclopedia of Fraud*, Third Edition, CDRom, J. Wells (Ed.), Association of Certified Fraud Examiners, Austin, Texas

Association of Certified Fraud Examiners (ACFE), 2007b, *Fraud Examiners Manual*, Association of Certified Fraud Examiners: Austin TX

Association of Certified Fraud Examiners (ACFE), 2009a, *Fraud Examiners Manual: International Edition*, Association of Certified Fraud Examiners: Austin TX

Association of Certified Fraud Examiners (ACFE), 2009b, *Occupational Fraud: A study of the impact of an economic recession*, Association of Certified Fraud Examiners, http://www.acfe.com/occupational-fraud/occupational-fraud.asp, accessed 8/10/09

Association of Certified Fraud Examiners (ACFE), 2013, *Evaluating Different Types of Evidence in Investigations*, ACFE, March, http://www.acfe.com/content.aspx?id=4294977422&terms=(evidence)+, last accessed 27/7/16.

Association of Certified Fraud Examiners (ACFE), 2014a, *Comparison of Fraud Schemes*, Association of Certified Fraud Examiners, http://www.acfe.com/rttn-schemes.aspx, accessed 29/9/14.

Association of Certified Fraud Examiners (ACFE), 2014b, *Report to the Nations on Occupational Fraud and Abuse: 2014 Global Fraud Study*, Association of Certified Fraud Examiners, http://www.acfe.com/rttn/docs/2014-report-to-nations.pdf, last accessed 7/5/15.

Association of Certified Fraud Examiners (ACFE), 2015a, *Who We Are*, Association of Certified Fraud Examiners, http://www.acfe.com/who-we-are.aspx, last accessed 8/5/15.

Association of Certified Fraud Examiners (ACFE), 2015b, *The CFE Credential*, http://www.acfe.com/cfe-credential.aspx, accessed 20/11/15.

Australian Securities & Investments Commission (ASIC), 2010, 'Report 192: Audit Inspection Program Public Report for 2008–09', http://asic.gov.au/regulatory-resources/find-a-document/reports/rep-192-audit-inspection-program-public-report-for-2008-09/, accessed 20/11/15.

Auditing and Assurance Standards Board (AUASB), 2009, *Auditing Standard ASA 530 Audit Sampling*, Auditing and Assurance Standards Board, http://www.auasb.gov.au/admin/file/content102/c3/ASA_530_27-10-09.pdf, last accessed 20/11/15.

Auditing and Assurance Standards Board (AUASB), 2011, *Auditing Standard ASA 700 Forming an Opinion and Reporting on a Financial Report*, Auditing and Assurance Standards Board, http://www.auasb.gov.au/admin/file/content102/c3/Jun11_Compiled_ASA_700.pdf, last accessed 8/5/15.

Auditing and Assurance Standards Board (AUASB), 2013a, *Auditing Standard ASA 240: The Auditor's Responsibilities Relating to Fraud in an Audit of a Financial Report*, http://www.auasb.gov.au/admin/file/content102/c3/Nov13_Compiled_Auditing_Standard_ASA_240.pdf, accessed 29/9/14.

Auditing and Assurance Standards Board (AUASB), 2013b, Auditing Standard ASA 200: Overall Objectives of the Independent Auditor and the Conduct of an Audit in Accordance with Australian Auditing Standards, http://www.auasb.gov.au/admin/file/content102/c3/Nov13_Compiled_Auditing_Standard_ASA_200.pdf, accessed 20/11/15.

Auditing and Assurance Standards Board (AUASB), 2013c, *Auditing Standard ASA 315: Understanding the Entity and Its Environment and Assessing the Risks of Material Misstatement*, http://www.auasb.gov.au/admin/file/content102/c3/Nov13_Compiled_Auditing_Standard_ASA_315.pdf, accessed 20/11/15.

Auditing and Assurance Standards Board (AUASB), 2013d, *Auditing Standard ASA 500: Audit Evidence*, http://www.auasb.gov.au/admin/file/content102/c3/Nov13_Compiled_Auditing_Standard_ASA_500.pdf, accessed 20/11/15.

Australian Law Reform Commission (ALRC), 2006, 'The definition of substantial probative value', *Uniform Evidence Law (ALRC Report 102)*, http://www.alrc.gov.au/publications/12.%20The%20Credibility%20Rule%20and%20its%20Exceptions/definition-substantial-probative-value, accessed 27/11/15.

Australian Securities and Investment Commission (ASIC), *2010, Report 192: Audit Inspection Program Public Report for 2008–09*, http://asic.gov.au/regulatory-resources/find-a-document/reports/rep-192-audit-inspection-program-public-report-for-2008-09/, accessed 20/11/15.

Australian Securities and Investment Commission (ASIC), 2015, *Report 461: Audit inspection program report for 2014–15*, http://download.asic.gov.au/media/3491241/rep-461-published-15-december-2015.pdf, accessed 25/7/16.

Backof, A. G., Bamber, E. M., & Carpenter T. D., 2014, *More precise versus less precise accounting standards: The effect of auditor judgment frameworks in constraining aggressive reporting*, Working paper, University of Virginia and University of Georgia, https://www.mccombs.utexas.edu/~/media/Files/MSB/Departments/Accounting/Brownbag%20papers/CarpenterPaper.PDF, accessed 27/11/15.

Backof, A. G., Thayer, J. & Carpenter, T. D., 2014, *Auditing Complex Estimates: Management-Provided Evidence and Auditors' Consideration of Inconsistent Evidence*, Available at SSRN: http://dx.doi.org/10.2139/ssrn.2279138, accessed 20/11/15.

Bamber, E.M., Ramsay, R.J. & Tubbs, R.M., 1997, 'An examination of the descriptive validity of the belief-adjustment model and alternative attitudes to evidence in auditing', *Accounting, Organizations and Society*, Vol. 22, Issues 3–4, pp. 249–268.

Bandura, A., 1993, 'Perceived Self-Efficacy in Cognitive Development and Functioning', *Educational Psychologist*, Vol. 28(2), pp.117-148.

Barrows, S., Mahidhar, V., and Kambil, A., 2010, 'Judgment sustained', *Deloitte Review*, http://professionaljudgmentmatters.blogspot.com.au/2011/08/judgment-sustained.html, accessed 20/11/15.

Bastiat, F., 1845, *Economic Sophisms*, Arthur Goddard (trans., ed., 1996), Library of Economics and Liberty, http://www.econlib.org/library/bastiat/basSoph0.html, accessed 9/9/06.

Bazerman, M. H., Loewenstein, G. & Moore, D. A., 2002, 'Why good accountants do bad audits', *Harvard Business Review* (November), pp. 97–102.

Beasley, M. S., Carcello, J. V., & Hermanson, D. R., 2001, 'Top 10 audit deficiencies', *Journal of Accountancy* 191(4), pp. 63–66.

Bell, T B, Peecher, M E & Solomon, I., 2005, *The 21st Century Public Company Audit: Conceptual Elements of KPMG's Global Audit Methodology*, KPMG LLP, http://www.business.illinois.edu/kpmg-uiuccases/monograph2.pdf, accessed 12/7/15.

Birnberg, J.G., 2011, 'A Proposed Framework for Behavioral Accounting Research', *Behavioural Research in Accounting*, Vol. 23(1), pp. 1 – 43.

Blake Dawson Waldron: Lawyers, 2003, *Corporate Governance Update*, May, https://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjR16H1zo3OAhVDI5QKHcVmBrkQFggbMAA&url=https%3A%2F%2Fwww.ashurst.com%2Fdoc.aspx%3Fid_Content%3D10989&usg=AFQjCNFiPa0CB7cAC3r76g022Zub2FwG4A&bvm=bv.127984354,d.dGo, accessed 29/6/16.

Bonner, S. E., 1999, 'Judgement and Decision Making Research in Accounting', *Accounting Horizons*, 13(4), pp. 385-398.

Brazel, J.F., Jackson, S.B., Rech, T.J., & Stewart, B.W, 2013, *Hindsight Bias and Professional Skepticism: Does the end justify the means?*, working paper, https://www.researchgate.net/publication/272242071_Hindsight_Bias_and_Professional_Skepticism_Does_the_End_Justify_the_Means, accessed 25/7/16.

Brown, K., 2003, 'Off the Rails', *CA Charter*, 74(3), p. 21.

Brown, T., Majors, T.M. & Peecher, M.E., 2014, The Impact of a Judgment Rule and Critical Audit Matters on Assessments of Auditor Legal Liability – The Moderating Role of Legal Knowledge, Available at SSRN: http://dx.doi.org/10.2139/ssrn.2483221, accessed 12/7/15.

Brown-Liburd, H.L, Cohen, J. & Trompeter, G., 2013, 'Effects of Earnings Forecasts and Heightened Professional Skepticism on the Outcomes of Client-Auditor Negotiation', *Journal of Business Ethics*, Vol. 116, pp. 311-325.

Budner, S., 1962, 'Intolerance of ambiguity as a personality variable', *Journal of Personality*, Vol 30(1), pp. 29-50.

Burns, R., 2002, *The Adult Learner at Work: The challenges of lifelong education in the new millennium*, 2nd edn., Allen & Unwin, Sydney.

Butler, S., 1986, 'Anchoring in the Judgmental Evaluation of Audit Samples', *The Accounting Review*, 61(1), pp. 101-111.

Cambridge University Press, 2015, 'Professional', *Cambridge Dictionaries Online*, http://dictionary.cambridge.org/dictionary/english/professional, accessed 20/11/15.

Carmichael, D. R., 1975, 'What is the Independent Auditor's Responsibility for the Detection of Fraud?', *Journal of Accountancy*, 140(5), pp.76-79.

Canadian Public Accountability Board (CPAB). 2013. *CPAB Public Report*, http://www.cpab-ccrc.ca/Documents/Topics/Public%20Reports/2013_Public_Report_EN.pdf, accessed 20/11/15

Carpenter, T. D., Durtschi, C., & Gaynor, L. M., 2011, 'The incremental benefits of a forensic accounting course on skepticism and fraud-related judgments', *Issues in Accounting Education,* 26 (1), pp. 1–21.

Carpenter, T. & Reimers, J.L., 2009, *Professional Skepticism: The Effects of a Partner's Influence and the Presence of Fraud on Auditors' Fraud Judgments and Actions*, Available at SSRN: http://dx.doi.org/10.2139/ssrn.1068942, accessed 20/11/15.

Carpenter , T. D., & Reimers J. L., 2013, 'Professional skepticism: The effects of a partner's influence and the level of fraud indicators on auditor's fraud judgments and actions', *Behavioral Research in Accounting*, 25(2), pp. 45-69.

Cassidy, M. F. & Buede, D., 2009, 'Does the accuracy of expert judgment comply with common sense: caveat emptor', *Management Decision*, Vol. 47(3), pp. 454-469.

Castro, G.S., 2013, *Internal Auditors' Skepticism in Detecting Fraud: A Quantitative Study*, Available at SSRN: http://dx.doi.org/10.2139/ssrn.2222097, accessed 20/11/15

Centre for Audit Quality (CAQ), 2010, Report on Deterring and Detecting Financial Reporting Fraud. A Platform for Action, http://www.thecaq.org/docs/reports-and-publications/deterring-and-detecting-financial-reporting-fraud-a-platform-for-action.pdf?sfvrsn=0, accessed 20/11/15.

Changa, S-I., Tsaia, C-F., Shihb, D-H., & Hwanga, C-L., 2008, 'The development of audit detection risk assessment system: Using the fuzzy theory and audit risk model', *Expert Systems with Applications*, Volume 35 (3), Pages 1053–1067.

Chartered Accountants: Australia & New Zealand (CA ANZ), 2014, *Professional Scepticism Paramount for Auditors*, http://www.charteredaccountants.com.au/Industry-Topics/Quality-review/Recent-headlines/Recent-headlines/Professional-scepticism-paramount-for-auditors.aspx, accessed 25/7/16.

CPA Australia, 2016, Outcome of Disciplinary Hearings, CPA Australia Ltd, https://www.cpaaustralia.com.au/about-us/member-conduct-and-discipline/outcome-of-disciplinary-hearings, accessed 26/7/16.

Choo, F., & Tan, K., 2000. Instruction, skepticism, and accounting students' ability to detect frauds in auditing. *Journal of Business Education*, 1(Fall), pp. 72–87.

Chughtai, A.A. & Buckley, F., 2008, 'Work Engagement and its Relationship with State and Trait Trust: A Conceptual Analysis', *Journal of Behavioral and Applied Management*, 10(1), pp. 47-71.

Cohen, J.R., Dalton, D.W. & Harp, N.L., 2014, *The Effect of Professional Skepticism on Job Attitudes and Turnover Intentions within the Audit Profession*, SSRN: http://dx.doi.org/10.2139/ssrn.2410547, accessed 20/11/15.

Committee of Sponsoring Organisations of the Treadway Commission, 1998, *Fraudulent Financial Reporting: 1987-1997 – An analysis of US public companies*, COSO, http://www.coso.org/publications/executive_summary_fraudulent_financial_reporting.htm, accessed 6/9/06.

Commonwealth of Australia, 2003, *The Failure of HIH Insurance, Volume III: Reasons, circumstances and responsibilities*, National Library of Australia, http://pandora.nla.gov.au/pan/23212/20030418-0000/www.hihroyalcom.gov.au/finalreport/Title%20and%20Contents3.html, accessed 29/6/16.

Companies Auditors and Liquidators Disciplinary Board (CALDB), 2016a, *About CALDB*, www.caldb.gov.au, accessed 26/7/16.

Companies Auditors and Liquidators Disciplinary Board (CALDB), 2016b, *CALDB Decisions*, http://www.caldb.gov.au/decisions/caldb-decisions/, accessed 26/7/16.

Corporations Act (Australia) 2001, Cth

Cuccia, A.D. & McGill, G.A., 2000, 'The Role of Decision Strategies in Understanding Professionals' Susceptibility to Judgment Biases', *Journal of Accounting Research*, 38(2), pp. 419-435.

Cushing, B.E. & Ahlawat, S.S., 1996, 'Mitigation of Recency Bias in Audit Judgment : The effect of documentation', *Auditing*, Vol. 15(2), pp. 110.

De Martinis, M.R. & Burrowes, A.W., 1996, 'Materiality and Risk Judgments : A review of users' expectations', *Managerial Finance*, 22(9), pp. 16-34.

Dorminey, J., Fleming, A.S., Kranacher, M-J. & Riley Jr, R.A., 2012, 'The Evolution of Fraud Theory', *Issues in Accounting Education*, Vol 27(2), pp. 555-579.

Erickson, M., Mayhew, B. W., & Felix, W. L., 2000, 'Why do audits fail? Evidence from Lincoln Savings and Loan', *Journal of Accounting Research* (Spring), pp. 165–194.

Farag, M.S. & Elias, R.Z., 2012, 'The Impact of Accounting Students' Professional Skepticism on their Ethical Perception of Earnings Management', *Research on Professional Responsibility and Ethics in Accounting*, Vol 16, pp. 185 – 200.

Farlex Inc, 2015, 'Probative', *Legal Dictionary*, http://legal-dictionary.thefreedictionary.com/probative, accessed 27/11/15.

Fisher C., 2007, "*The future of audit in NZ*", Chartered Accountants Journal of New Zealand, February, 86(1), p.25.

Fleming, S.M., Thomas, C.L. & Dolan, R.J., 2010, Overcoming Status Quo Bias in the Human Brain, Proceedings of the National Academy of Sciences, http://www.pnas.org/content/107/13/6005.full.pdf, accessed 20/11/15.

Fomento (Sterling Area) Ltd. v Selsdon Fountain Pen Co Ltd [1958] 1 All ER11

Frank, M.L. & Hoffman, V.B., 2015, 'Discussion of construal instructions and professional scepticism in evaluating complex estimates', *Accounting, Organizations & Society*, in press, http://dx.doi.org/10.1016/j.aos.2015.04.005, accessed 10/7/15.

Fukukawa, H., & Mock, T. J., 2011, 'Audit risk assessments using belief versus probability', *Auditing: A Journal of Practice & Theory*, Vol. 30 (1), pp. 75–99.

Gibson, R. & Arnold, R., 1981, 'The Development of Auditing Standards in Australia', *The Accounting Historians Journal*, Spring 1981, 8(1).

Gilovich, T., 1991, *How We Know What Isn't So: The fallibility of human reason in everyday life*, The Free Press: New York

Glover, S. M., & Prawitt, D. F., 2014, 'Enhancing Auditor Professional Skepticism: The Professional Skepticism Continuum', *Current Issues in Auditing*, 8(2), pp. P1-P10.

Glover, S. M., Prawitt, D. F., & Wilks, T. J., 2005, 'Why Do Auditors Over-Rely on Weak Analytical Procedures? The role of outcome and precision', *Auditing: A Journal of Practice & Theory*, Vol 24 supplement, 2005, pp. 197-220.

Goldmann, P., 2009, 'Fraud During Tough Economic Times: What kinds of fraud are on the rise?', *Fraud Examiner Newsletter Article*, ACFE, http://www.acfe.com/newsletters/fraud-examiner.asp?copy=oct09-goldmann-column, accessed 9/10/09

Griffith, E. E., Hammersley, J. S., & Kadous, K. (2014). 'Audits of complex estimates as verification of management numbers: How institutional pressures shape practice', *Contemporary Accounting Research*, Volume 32 (3), pp. 833–863.

Grenier, J. H. 2014. Encouraging professional skepticism in the industry specialization era. Working Paper. Available at SSRN: http://ssrn.com/abstract=1533622, last accessed 17/5/15.

Grenier, J.H., Pomeroy, B. & Stern, M.T., 2015, 'The Effects of Accounting Standard Precision, Auditor Task Expertise, and Judgment Frameworks on Audit Firm Litigation Exposure', *Contemporary Accounting Research*, 32(1), pp. 336-357.

Gunn, J., & Jules, D., 2012, *Professional Skepticism in an Audit of Financial Statements*, http://www.ifac.org/sites/default/files/publications/files/IAASB%20Professional%20Skepticism%20QandA-final.pdf, accessed 20/11/15.

Hall, J. 1996, 'How to Spot Fraud', *Journal of Accountancy*, October, Vol 182(4), pp.85-88.

Harding, N. & Trotman, K., 2015, *Enhancing Professional Skepticism via Partner Communication of Fraud Brainstorming Outcomes*, Accounting & Corporate Governance Seminar Series: 20th March, Tasmanian School of Business & Economics, University of Tasmania, http://www.utas.edu.au/__data/assets/pdf_file/0004/673060/Trotman-Enhancing-professional-skepticism.pdf, last accessed 15/5/15.

Harding, N., Azim, M.I., Jidin, R. & Muir, J.P., 2016, *Auditor Professional Scepticism: Impact of Trust and Distrust: A synthesis of research findings*, https://www.cpaaustralia.com.au/~/media/corporate/allfiles/document/professional-resources/auditing-assurance/auditor-professional-scepticism-impact-of-trust-and-distrust.pdf?la=en, accessed 26/7/16.

Hargreaves, S., 2013, 'How I 'Stole' $14 Million from a Bank: A security tester's tale', *CNN Money*, www.money.cnn.com/2013/05/15/technology/security/bank-heist/index.html, accessed 29/9/14.

Harrington, H. J. & McNellis, T., 2006, 'Mobilising the Right Lean Metrics for Success', *Quality Digest*, QCI International, http://www.qualitydigest.com/may06/articles/02_article.shtml, accessed 17/5/15.

Hoffman, V.B. & Zimbelman, M.F., 2009, 'Do Strategic Reasoning and Brainstorming Help Auditors Change Their Standard Audit Procedures in Response to Fraud Risk?', *The Accounting Review*, Vol. 84 (3), pp. 811-837.

Houghton Mifflin Company, 2004, 'Objectivity', *The American Heritage® Dictionary of the English Language, Fourth Edition*. http://dictionary.reference.com/browse/objectivity, accessed 16/3/09.

Houston, R. W., Peters, M. F. & Pratt, J. H., 1999, 'The audit risk model, business risk, and audit-planning decisions', *The Accounting Review*, 74 (July), pp. 281-298.

Hurtt, R. K., 2010, 'Development of a Scale to Measure Professional Skepticism', *Auditing: A Journal of Practice & Theory*, Vol. 29 (1), pp. 149–171.

Hurtt, R.K., Brown-Liburd, H.L., Earley, C.E., & Krishnamoorthy, G., 2013, 'Research on auditor professional skepticism – Literature synthesis and opportunities for future research', *Auditing: A Journal of Practice and Theory*, Vol. 32 (Supplement 1), pp. 45-97.

Humphrey, C. 2008, 'Auditing research: a review across the disciplinary divide', *Accounting, Auditing & Accountability Journal*, 21 (2), pp. 170-203.

International Federation of Accountants (IFAC), 2010, *IFAC response to the European Commission green paper on audit policy: Lessons from the crisis*, http://www.ifac.org/sites/default/files/publications/files/european-commission-s-gre.pdf, accessed 20/11/15.

Kadous, K., & Mercer, M., 2012, 'Can reporting norms create a safe harbor? Jury verdicts against auditors under precise and imprecise accounting standards', *The Accounting Review*, 87 (2), pp. 565–87.

Kang, Y.J., Trotman, A.J. & Trotman, K.T., 2015, 'The effect of an Audit Judgment Rule on audit committee members' professional skepticism: The case of accounting estimates', *Accounting, Organizations & Society*, in press, http://dx.doi.org/10.1016/j.aos.2015.03.001

Kashdan, T, Gallagher, M., Silvia, P., Winterstein, B, Breen, W., Terhar, D. & Steger, M., 2009, 'The Curiosity and Exploration Inventory-II: Development, factor structure, and psychometrics', *Journal of Research in Personality*, Vol 43, pp. 987-998.

Khan, M.J. & Harding, N., 2013, 'Towards an Understanding of the Antecedents and Consequences of Professional Skepticism', *2013 AFAANZ Conference*, http://www.afaanz.org/openconf/2013/modules/request.php?module=oc_program&action=view.php&id=175, accessed 18/7/13.

Kim, S. & Trotman, K.T., 2014, 'The Comparative Effect of Process and Outcome Accountability in Enhancing Professional Scepticism', *Accounting & Finance*, pp. 1-26.

Kingston Cotton Mill (No. 2) (1896) 2 Ch. 279

Kizirian, T. G., Mayhew, B. W. & Sneathen, L. D., 2005, 'The impact of management integrity on audit planning and evidence', *Auditing: A Journal of Practice & Theory*, 24 (2), pp. 49–67.

Knechel, W. R., Salterio, S. E. & Kochetova-Kozloski, N., 2010, 'The effect of benchmarked performance measures and strategic analysis on auditors' risk assessments and mental models', *Accounting, Organisations and Society*, Vol 35, pp. 316-333.

Koh, H.C. & Woo, E-S., 1998, 'The Expectation Gap in Auditing', *Managerial Auditing Journal*, 13(3), pp. 147-154.

KPMG, 2004, *Fraud Survey*, KPMG, http://www.kpmg.com.au/Portals/0/Fraud%20Survey%202004.pdf, accessed 8/9/06.

KPMG, 2013, *A Survey of Fraud, Bribery and Corruption in Australia and New Zealand, 2012*, KPMG, http://www.kpmg.com/AU/en/IssuesAndInsights/ArticlesPublications/Fraud-Survey/Documents/fraud-bribery-corruption-survey-2012v2.pdf, accessed 7/5/15.

KPMG, 2015, Sarbanes-Oxley compliance, KPMG Australia, http://www.kpmg.com/au/en/services/audit/regulatory-audit/sarbanes-oxley/pages/default.aspx, accessed 8/5/15.

Latimer, P., 2000, *Australian Business Law*, CCH, Sydney.

Logan, A., 2009, 'Risky Business: Robert Rudloff Jr., CFE, CIA, Stacks deck against fraudsters at MGM Mirage', *Fraud Magazine*, 23(5), pp.28-30, 50-52, ACFE, Austin TX

London and General Bank Ltd (No. 2) (1895) 2 Ch. 673

Luippold, B.L., Kida, T., Piercey, M.D.. & Smith J.F., 2015, 'Managing audits to manage earnings: The impact of diversions on an auditor's detection of earnings management', *Accounting, Organizations and Society*, 41, pp.39–54

Lund Research Ltd, 2013, *Testing for Normality using SPSS Statistics*, Laerd Statistics, https://statistics.laerd.com/spss-tutorials/testing-for-normality-using-spss-statistics.php, accessed 20/11/15.

Martinov-Bennie, N. & Pflugrath, G., 2009, 'The Strength of an Accounting Firm's Ethical Environment and the Quality of Auditors' Judgments', *Journal of Business Ethics*, 87, pp. 237-253.

McLeod, S., 2014, *Theories of Personality*, Simply Psychology, http://www.simplypsychology.org/personality-theories.html, accessed 29/6/16.

McMillan, J.J. & White, R.A., 1993, 'Auditors' Belief Revisions and Evidence Search: The effect of hypothesis frame, confirmation bias, and professional skepticism', *The Accounting Review*, Vol. 68(3), pp. 443 – 465.

Miller, J., 1991, 'Short report: Reaction time analysis with outlier exclusion – Bias varies with sample size', *The Quarterly Journal of Experimental Psychology Section A*, 43(4), pp. 907-912.

Mintz, S., 1995, 'Virtue Ethics and Accounting Education', *Issues in Accounting Education*, 10(2), pp. 247-267.

Mirshekary, S., Yaftian, A.M. & Cross, D., 2005, 'Australian Corporate Collapse: The case of HIH Insurance', *Journal of Financial Services Marketing*, 9(3), pp.249-258.

Naydorf, I., 2004, 'Don't Let it Happen to You', *Washington Business Journal*, August 14, http://washington.bizjournals.com/washington/stories/2004/08/02/focus8.html, accessed 15/4/06.

Nelson, M.W., 2009, 'A model and literature review of professional skepticism in auditing', *Auditing: A Journal of Practice & Theory*, 28(2), pp. 1-34.

Nelson, M. & Tan, H.T., 2005, 'Judgement and Decision Making Research in Auditing: A task, person, and interpersonal interaction perspective', *Auditing: A journal of practice & theory*, Vol 24, Supplement, pp. 41-71.

Nelsona, I.T., Ratliffa, R.L., Steinhoffb, G. & Mitchellc, G.J., 2003, 'Teaching logic to auditing students: can training in logic reduce audit judgment errors?', *Journal of Accounting Education*, Vol 21(3), pp. 215–237.

New Scientist, 2005, *How the Human Brain Works*, http://www.newscientist.com/movie/brain-interactive, accessed 20/7/10.

Nigrini, M.J. & Mueller, N.J., 2014, 'Lessons from an $8 Million Fraud', *Journal of Accountancy*, http://www.journalofaccountancy.com/Issues/2014/Aug/fraud-20149862.htm, accessed 29/9/14.

Nolder, C. & Kadous, K., 2014, The Way Forward on Professional Skepticism: Conceptualizing Professional Skepticism as an Attitude, Working Paper, Suffolk University and Emory University, SSRN: http://ssrn.com/abstract=2524573, accessed 26/2/15.

O'Donnell, K.G., Hicks, B., Streeter, J. & Shantapriyan, P., 2015, 'Getting it right: directors' assessment of information', *Managerial Auditing Journal*, Vol. 30(2), pp. 117 – 131.

O'Leary, C. & Cotter, D., 2000, 'The Ethics of Final Year Accountancy Students: An international comparison', *Managerial Auditing Journal*, 15(3), pp. 108-114.

O'Malley, A., 2016, 'Why is it Proving so Hard to Lift Audit Quality?', *In The Black*, CPA Australia, http://intheblack.com/articles/2016/06/24/why-is-it-proving-so-hard-to-lift-audit-quality, accessed 25/7/16.

Oxford University Press, 2015, 'Belief', *Oxford Dictionaries*, http://www.oxforddictionaries.com/definition/english/belief, accessed 20/11/15.

Pacific Acceptance. Corporation v. Forsyth (1970) 92 WN (NSW) 29

Payne, E.A. & Ramsay, R.J., 2005, 'Fraud Risk Assessments and Auditors' Professional Skepticism', *Managerial Auditing Journal*, Vol 20(3), pp. 321 – 330.

Peecher, M. E., Schwartz, R., and Solomon, I., 2007. It's all about audit quality: Perspectives on strategic-systems auditing. *Accounting, Organizations and Society*, Vol. 32, pp. 463–485.

Peecher, M. E., Solomon, I., & Trotman, K. T., 2013a, 'Improving the quality of financial statement audits by updating external auditors' accountabilities', *Accounting, Organizations and Society*, 38 (8), pp. 596-620.

Peecher, M.E., Solomon, I. & Trotman, K.T., 2013b, 'An accountability framework for financial statement auditors and related research questions', *Accounting, Organizations and Society*, 38, pp. 596–620.

Peytcheva, M., 2014, 'Professional skepticism and auditor cognitive performance in a hypothesis-testing task', *Managerial Auditing Journal*, 29(1), pp. 24-49.

Peterson, B. K. & Zikmund, P. E. (2004), '10 Truths You Need to Know About Fraud', *Strategic Finance*, May, Vol 85(11), pp.28-34.

Pinsker, R., Pennington R., & Schafer J. K., 2009, 'The influence of roles, advocacy, and adaptation to the accounting decision environment', *Behavioral Research in Accounting,* 21 (2), pp. 91–111.

Plumlee, D., Rixom B. A., & Rosman A. J., 2012, *Training Auditors to Think Skeptically*, Working paper, The University of Utah, and University of Connecticut, http://web.ku.edu/~audsymp/myssi/_pdf/Plumlee%20et%20al.%202012%20Training%20Auditors%20to%20Think%20Skeptically%20-%20April%202012%20KU%20Symposium.pdf, accessed 20/11/15.

Popova, V., 2013, 'Exploration of Skepticism, Client-Specific Experiences, and Audit Judgments', *Managerial Auditing Journal*, Vol. 28(2), pp. 140 – 160.

Preston, K.S.J. & Reise, S.P., 2013, 'Estimating the Nominal Response Model Under Nonnormal Conditions', *Educational and Psychological Measurement*, 74(3), pp. 377–399.

Public Company Accounting Oversight Board (PCAOB), 2007, *Observations on Auditors' Implementation of PCAOB Standards Relating to Auditors' Responsibilities with Respect to Fraud, Release No. 2001-001*, January 22, http://pcaobus.org/Inspections/Documents/2007_01-22_Release_2007-001.pdf, accessed 27/11/15.

Public Company Accounting Oversight Board (PCAOB), (2012a), *PCAOB Staff Audit Practice Alert No. 10: Maintaining and applying professional skepticism in audits*, http://pcaobus.org/standards/qanda/12-04-2012_sapa_10.pdf, last accessed 17/5/15.

Public Company Accounting Oversight Board (PCAOB), 2012b, 'Maintaining and applying professional skepticism in audits', *PCAOB Staff Audit Practice Alert No. 10*., http://pcaobus.org/standards/qanda/12-04-2012_sapa_10.pdf, accessed 20/11/15.

Quadackers, L., Groot, T, & Wright, A., 2009, *Auditors' Skeptical Characteristics and Their Relationship to Skeptical Judgments and Decisions*, SSRN, http://ssrn.com/abstract=1478105, accessed 20/11/15.

Qadackers, L., Groot, T. & Wright, A., 2014, 'Auditors' Professional Skepticism: Neutrality versus Presumptive Doubt', *Contemporary Accounting Research*, Vol. 31(3), pp. 639 – 657.

Random House Inc., (2009) 'objectivity', *Dictionary.com Unabridged (v 1.1)*. http://dictionary.reference.com/browse/objectivity, accessed 16/3/09.

Rasso, J.T., 2015, 'Construal Instructions and Professional Skepticism in Evaluating Complex Estimates', *Accounting, Organizations and Society*, 46, pp.44-55.

REAGAN Accounting & Consulting Group, nd, *Fraud Prevention*, http://www.reagan-solutions.com/fraud.html, accessed 20/11/15.

Robinson, S.N., Curtis, M.B. & Robertson, J.C., 2013, *A Person-Situation Approach to the Examination of Professional Skepticism: Consideration of time epressure and goal framing*, Available at SSRN: http://dx.doi.org/10.2139/ssrn.2276478, accessed 18/5/15.

Rose, J.M., 2007, 'Attention to evidence of aggressive financial reporting and intentional misstatement judgments: Effects of experience and trust', *Behavioral Research in Accounting*, Vol 19, pp. 215–229.

Rose, A.M., Rose, J.M. & Dibben, M., 2010, 'The Implications of Auditors' Dispositional Trust and Career Advancement Opportunities for the Detection of Fraud', *Journal of Forensic & Investigative Accounting*, Special Issue, Vol. 2 (3), pp. 141 – 163.

Rotter, J. B., 1967, 'A new scale for the measurement of interpersonal trust', *Journal of Personality*, 35 (4): 651–65.

Rotter, J.B., 1980, 'Interpersonal trust, trustworthiness and gullibility', *American Psychologist*, *35*, 1-7.

Samejima, F., 1997, 'Graded Response Model', *Handbook of Modern Item Response Theory*, W. J. van der Linden & R. K. Hambleton (eds), Springer, New York, pp. 85-100.

Shaub, M.K. & Lawrence, J.E., 1996, 'Ethics, experience, and professional skepticism: A situational analysis', *Behavioral Research in Accounting*, 8(Supplement), pp. 124–157.

Smith, J.F. & Kida, T., 1991, 'Heuristics and Biases: Expertise and task realism in auditing', *Psychological Bulletin*, Vol. 109(3), pp. 472 – 489.

Staheli, L.T., Chew, D.E. & Corbett, M., 1987, 'The longitudinal arch. A survey of eight hundred and eighty-two feet in normal children and adults', *The Journal of Bone & Joint Surgery*, 69 (3), pp. 426-428.

Svanström, T., 2015, 'Time Pressure, Training Activities and Dysfunctional Auditor Behaviour: Evidence from Small Audit Firms', *International Journal of Auditing*, Early View Online, Article first published online: 21 September 2015, DOI: 10.1111/ijau.12054.

Templin, J., 2007, *IRT Models for Polytomous Response Data*, University of Kansas, http://jonathantemplin.com/files/irt/irt07ku/irt07ku_lecture03.pdf, accessed 5/5/14.

Transparency International, 2014, *Corruption Perceptions Index 2014*, https://www.transparency.org/whatwedo/publication/cpi2014, last accessed 8/5/15.

Trompeter, G.M., Carpenter, T.D., Desai, N., Jones, K.L. &. Riley, Jr, R.A., 2013, 'A Synthesis of Fraud-Related Research', *Auditing: A Journal of Practice & Theory*, 32 Supplement 1, pp. 287–321.

Trompeter, G., & Wright, A., 2010. The world has changed—Have analytical procedure practices? *Contemporary Accounting Research* 27 (2): 669–700.

Trotman, K., 2006, *Professional judgment: are auditors being held to a higher standard than other professionals?*, The Institute of Chartered Accountants in Australia (ICAA), http://www.charteredaccountants.com.au/~/media/Files/Industry%20topics/Audit%20and%20Assurance/Resources%20Toolkit/Prof_Judgement_report_0906.ashx, accessed 12/7/15.

Trotman, K. T., Simnett, R., and Khalifa, A., 2009, 'Impact of the type of audit team discussions on auditors' generation of material frauds', *Contemporary Accounting Research*, 26 (4), pp. 1115–1142.

Quadackers, L., Groot, T. & Wright, A., 2014, 'Auditors' Professional Skepticism: Neutrality versus Presumptive Doubt', *Contemporary Accounting Research*, 31(3), pp. 639–657.

Van Peursem, K.A., 2010., *Dairy Containers' New Zealand Audits 1981-1989: Pyrrhic Victory for the Ancient Sceptic*, Conference Paper, The Sixth Accounting History International Conference, Wellington: New Zealand, http://www.victoria.ac.nz/sacl/about/events/past-events2/past-conferences/6ahic/publications/6AHIC-33_FINAL_Paper.pdf, accessed 19/5/15.

Welch, D. & Carson, V., 2010, 'Man Pleads Guilty in $150m Bank Fraud Case', *Sydney Morning Herald online*, March 9, http://www.smh.com.au/new/man-pleads-guilty-in-150m-bank-fraud-case-20100308-psuz.html, accessed 15/3/10.

Wells, J. T., 2003, 'Corruption: Causes and cures', *Journal of Accountancy*, 195(4) pp. 49-52.

Wells, J. T., 2005, *Accountants Need Help Fighting War on Fraud: ACFE founder urges anti-fraud education*, Association of Certified Fraud Examiners, October 12, http://www.acfe.com/about/press-release-10-12-2005.asp, accessed 7/5/06.

Westermann, K., Cohen, J. & Trompeter, G., 2014, *The Influence of Accountability on Professional Skepticism*, SSRN, http://dx.doi.org/10.2139/ssrn.2528648, accessed 19/5/15.

Wilensky, U. & Resnick, M., 1999, 'Thinking in Levels: A Dynamic Systems Approach to Making Sense of the World', *Journal of Science Education and Technology*, Volume 8(1), pp 3 - 19.

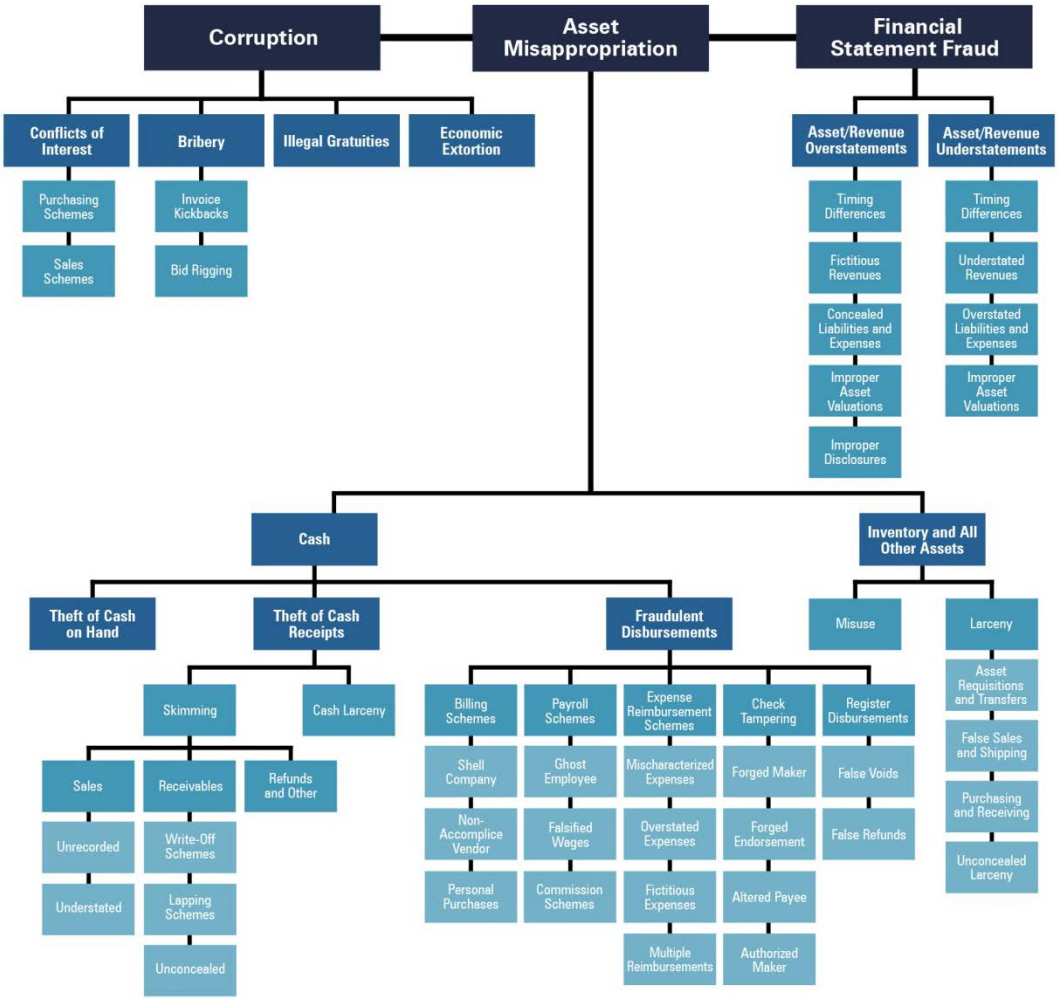
Wong, J. (Ed), 2008, *Auditing, Assurance and Ethics Handbook 2008*, CPA Australia, Pearson Education: Melbourne.

Wright, W.F., 1995, 'Superior loan collectability judgments given graphical displays', *Auditing: A Journal of Practice and Theory*, 14 (2), pp. 144-154.

Wrightsman, L., 1991, 'Interpersonal Trust and Attitudes Toward Human Nature', *Measures of Personality and Social Psychological Attitudes: Vol 1 - Measures of Social Psychological Attitudes*, edited by J. Robinson, P. Shaver & L. Wrightsman, San Diego, CA, Academic Press.

Zipkin, A., 2009, 'A Help-Wanted Sign for Fraud Investigators', *The New York Times*, March 21, http://www.nytimes.com/2009/03/22/jobs/22fraud.html?_r=3&pagewanted=print, accessed 26/3/09.

Appendix 1: Fraud Schemes



SOURCE: ACFE, 2014a:11

NB: Theft might be recognised and reported in financial statements as shrinkage, for example. Unrecognised schemes may result in unintentional misstatements or, where a perpetrator has covered up his/her crime by altering records, as fraudulent misstatements.

Appendix 2: Overview of Prior Empirical Studies

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Backof, Thayer & Carpenter	2014	Explore influences of textual v graph format client evidence on PS.	A 2 x 3 between-participants experiment, manipulating two variables in a hypothetical audit case.	154 audit managers and partners from one Big 4 firm.	Prompts to consider client methods increases PS, particularly when evidence is in graph format.
Brazel, Jackson, Rech & Stewart	2013	Explores the potential effects of hindsight bias in audit supervisors evaluations of auditor scepticism.	2 x 2 between-participants experiment, involving a hypothetical audit case and a study-specific survey.	76 senior auditors from an international firm, averaging 45 months' experience.	Results indicate that hindsight bias on the part of reviewers is known to auditors and creates a barrier to auditor scepticism. Clients also under-rate PS if no misstatement is identified.
Brown-Liburd, Cohen & Trompeter	2013	Explores whether auditors are influenced by clients' forecast achievement and heightened PS in the post-SOX environment.	Experiment involving random assignment of 3 hypothetical cases, manipulating earnings forecasts, and using study-specific proxies for PS and skeptical action.	38 audit managers and partners from two Big 4 firms, with experience in the hypothetical case activities.	Auditors do not appear to be influenced by client forecast achievement ability. Further, auditors with heightened PS are more ethical and conservative. Earnings forecast and PS were significantly related.

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Carpenter & Reimers	2009	Examines effects of partner attitude to PS, and the presence of fraud, on auditors' identification of fraud risk factors, fraud risk assessments, and selection of audit procedures.	Experiment, manipulating partner emphasis and fraud risk indicators in a hypothetical auditing task. Measures involved a study-specific questionnaire and coder rating of audit procedures.	80 audit managers from Big 4 firms, average experience 7.93 years, attending several sessions.	Auditors' fraud risk assessments are higher when fraud is present , and higher with a partner who emphasizes PS. Audit procedure choice is responsive to fraud risk when fraud is present, but only with a partner who emphasizes PS.
Castro	2013	Explores effects of experience on PS.	Utilised the Hurtt (2010) trait scale and the Fraud Indicator Symptoms Scale (Fullerton & Durtschi, 2004).	Cluster sampling via social media, targeting professional network groups in USA and Canada (n=199).	Auditors unable to influence judgment to detect fraud, and experience does not increase PS.

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Cohen, Dalton & Harp	2014	Examines the impact of the Neutral and Presumptive Doubt perspectives of PS on auditors' job attitudes and turnover intentions.	Scales used include Neutral PS (Hurtt scale, 2010); PD PS (inverse Wrightsman Trust scale, 1991); Job fit (Lauver & Kristof-Brown scale, 2001); Professional ID (an existing 5-item scale); and Organisational Trust (adapted from Kirkpatrick & Locke, 1996).	287 USA auditors from a cross section of firms. Average age 47.3 years.	The Neutral perspective is positively associated with low turnover, in contrast with the Presumptive Doubt perspective, which correlates with high turnover.
Cuccia & McGill	2000	Examines whether accountants' ability to structure a judgment task affects belief-adjustment given that evaluation order is a contextual factor incidental to the judgment task.	Two experiments, involving familiar and unfamiliar accounting contexts.	E1: 94 tax professionals from several offices of one Big 5 firm. Average 30 years of age with 5 years of tax experience. E2: 96 tax professionals from the same firm. Average 28 years of age with 4.2 years of experience.	Recency was dependent on interactions between control over the judgment task and the decision context, but only when subjects had no context-relevant knowledge or experience, or were precluded from structuring the task.

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Grenier	2014	Explores whether specialist auditors have more PS in the presence of prompts regarding evidence, or prompts to be self-critical.	2 x 3 between-participants experiment involving a hypothetical audit task with prompts. Uses a study-specific scale. Supplemental analyses of non-misstatements, process measures, and specificity of fraud explanations.	171 auditors: Specialists (insurance audit) and non-specialists (other auditors).	Specialization impedes some areas of PS due to increased confidence in, and reliance upon, prior knowledge and ability. Non-specialist accountants were more likely to consider fraud, but assigned it low probability. Findings offer a potential explanation for insufficient auditor scepticism.
Harding & Trotman	2015	Investigated PS in auditor judgments and actions pertaining to fraud brainstorming: Sceptical orientation and likelihood of fraud.	Two studies: a 2 x 2 x 3 design experiment involving a hypothetical audit case and manipulated variables. Measures: manipulation reinforcement questions, check questions, and the Hurtt (2010) Trait scale.	E1: 88 subjects from USA Big 4 firms. E2: 34 subjects from one Australian Big 4 firm.	Auditors are likely to be more sceptical when an assessment of low likelihood of fraud is attributed to management, rather than to the partner. This supports a 'reviewer perspective' incentive rather than a 'partner alignment' incentive. An outward sceptical orientation increases PS in actions only.
Hurtt	2010	Proposes that PS is a multi-dimensional individual characteristic, which can be a state as well as a trait.	Developed a 30-item scale to measure Trait PS.	Final scale iteration: 200 professional accountants, plus 88 for the re-test.	Findings provide preliminary evidence about the validity of the scale and appropriate inter-item and temporal stability.

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Khan & Harding	2013	Proposed that a belief system determines an individual's level of trait skepticism, which then determines state scepticism.	Using covariance based structural equation, modelled the antecedents and consequences of trait scepticism.	140 Postgraduate auditing students from an Australian university. Average age 24.52 years.	A belief system emphasising self direction and spirituality was positively associated with trait scepticism. A belief system emphasising tradition and universalism negatively associated. Elevated trait skepticism was negatively associated with evidence evaluation and judgments in light of that evidence. That is, higher levels of trait skepticism were associated with lower levels of state skepticism.
Kim & Trotman	2014	Investigates the effects of process and outcome accountability in enhancing the level of auditors' PS, and differences across experience levels.	Experiment, manipulating outcome and process accountability variables.	9 pre-experiment interviewees from Big 4 accounting firms. 63 experiment subjects: students (n=32) and assistant/senior auditors from Big 4 accounting firms (n=31).	Auditors show greater levels of PS when they are required to justify their judgment process, rather than their final judgments. Using process accountability, the PS of less experienced auditors increases further than that of more experienced auditors.

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Luippold, Kida, Piercey & Smith	2014	Examines whether client diversion of auditors' attention to either fairly stated accounts, or accounts containing other errors, affect auditors' ability to discover earnings management.	2 x 2 experiment involving a hypothetical case and manipulated variables.	Seventy-six auditors, averaging four years of audit experience. Neither experience nor rank significantly influenced results.	Auditors' earnings management detection is least effective when they are diverted to fairly stated accounts, and most effective when diverted to accounts containing other errors.
Martinov-Bennie & Pflugrath	2009	Examines whether an accounting firm's ethical environment affects auditor judgment, and whether the impacts are different at varying levels of audit expertise.	2 x 2 between-subjects experiment, examining audit experience and ethical environment, measured via a study-specific scale.	Audit seniors (n=44) and managers (n=42) from a Big 4 Australian accounting firm.	Results suggest that a difference in ethical environment will have greater impact for more experienced auditors; and greater accountability pressures lead to more conservative auditor judgments.
McMillan & White	1993	Test influence of contextual frame, confirmation bias and professional scepticism on auditors' belief revisions and evidence searches.	2-stage experiment, testing auditor confirmation bias and belief revision, using audit tasks.	Auditors: 50 staff, 50 seniors, and 66 partners and managers in full-time auditing positions	When belief revision was [self] measured with an absolute scale, auditors were more responsive to disconfirming evidence than to confirming evidence. This was not true when a proportional scale was used.
Peytcheva	2014	Explores effects of Trait in the presence of two types of State prompts, using a hypothetical Auditing task	2x2 Experiment: Trait measured by Hurtt's (2010) Trait Scale.	Auditing students (n=78) and practising auditors (n=85).	Prompts achieve no incremental effects on experienced auditors, but they are likely to assist novices.

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Popova	2013	Examines how levels of Trait skepticism and hypothetical client experiences affect audit judgments.	2 x 3 between-subjects experiment measuring trait skepticism (more vs less skeptical) and previous experiences of a hypothetical client (positive vs negative vs none). Measures are Hurtt's (2010) trait scale and a study-specific task scale.	79 Auditing students, at undergraduate (n=53) and postgraduate levels (n=26); some with auditing experience (n=25).	Initial auditor expectations are driven primarily by client experience, particularly for low-Trait participants. Expectations are driven by trait only when no client experience exists. High-Trait participants are more sensitive to fraud evidence at the evaluation stage.
Quadackers, Groot & Wright	2009	An experiment explores relationships between interpersonal trust, suspension of judgment, and locus of control. A new scale to measure auditor PS was also introduced, and influence of client control environment on the relationship between skepticism characteristics and auditors' judgments and decisions is also examined.	Experiment, using a hypothetical audit case and manipulated control environment. using Four scales: Rotter's Interpersonal Trust Scale (1967), the Need for Cognitive Closure Scale (Webster and Kruglanski, 1994), Rotter's Locus of Control scale (1966) and the Hurtt Professional Skepticism Scale (2007).	376 auditors from offices of the Big 4 auditing firms in the Netherlands. Participants ranged in experience from staff to partner level.	Overall, interpersonal trust is most significant in predicting skeptical judgments and decisions, but the relationship between auditors' characteristics, judgments and decisions appears to be dependent on the strength of the audit client's control environment.

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Quadackers, Groot & Wright	2014	Examine the relationship between PS perspectives: Neutrality and presumptive doubt.	A hypothetical audit task with manipulated control risk. Neutral PS measure: Hurtt (2010) Trait scale. Presumptive Doubt PS measure: Rotter Interpersonal Trust Scale (1967) inverse.	25 partners, 41 managers, 27 seniors, and 3 unclassified auditors from a single Big 4 firm, averaging 14.75 years' experience with the hypothetical scenario procedures.	In the low-risk setting, the inverse RIT and HPSS scales equally predict PS. In the high-risk setting, the inverse RIT is more predictive, indicating that presumptive doubt is antecedent to higher PS.
Rasso	2015	Investigates whether use of instructions about audit evidence documentation promote the collection and high-level analysis of evidence.	1 x 3 between-participants experiment involving a hypothetical audit task and prompts to heighten PS.	58 experienced auditors, from 6 accounting firms. Average experience 5.4 years. Positions range from staff auditor to partner.	Auditors think and act with more PS when using the instructions that promote higher-level analysis, and better process the collected evidence. However, task complexity could impede PS.
Robinson, Curtis & Robertson	2013	Measures and examines the trait and state components of PS, and their effects on auditors' behaviour. Also assesses the effects of two situational factors (prompts) on State Skepticism.	3-part experiment, using the Hurtt (2010) trait scale, a hypothetical auditing task, and an adaptation of the Hurtt scale to measure State PS.	126 senior-level auditors from a single Big-4 firm (mean age 26.85 years and mean experience 3.71 years)	Positive relationships between time pressure and State PS, and between higher levels of state PS and skeptical behaviors, but weaker results for trait PS. Results suggest a trait-state interaction such that auditors with low trait PS respond to high state PS with a greater increase in skeptical behaviors than auditors with high trait PS.

Author(s)	Date	Proposition(s)	Method	Data Source	Results
Rose, Rose & Dibben	2010	Investigates the potential for dispositional trust to influence auditors' career advancement.	Correlates dispositional trust scores with career positions, using the Wrightsman Trust Scale (1991).	216 practicing auditors from Big 4 firms (staff, seniors, managers, and partners).	Promotion was associated with higher levels of dispositional trust. Results indicate that trusting auditors are more likely to be promoted, but less trusting auditors are less likely, and may even leave the profession.
Shaub & Lawrence	1996	Defines and tests a model of PS as a function of ethics, experience and situation.	Structual equation modellingg evaluates relationships. PS is measured via 9 high(low) risk situations	156 auditors from a single Big 6 firm.	Professional ethics is associated with higher PS than situational ethics; and certified accountants are more sceptical than uncertified. Independence threats reduce PS.
Westermann, Cohen & Trompeter	2014	Examine auditors' perceptions of PS and perceived effects of accountability on PS.	Survey using both quantitative and qualitative questions	77 auditors of varying experience	Auditors believe PS is necessary but not enough of itself. Quality accountabilities promote scepticism, but pressure accountabilities weaken it.

Appendix 3: Research Invitations

Examples of the short-form invitations sent via social media is shown below. It was necessary to keep these very brief to fit the format of social media communications, so readers were redirected to a website with the formal Invitation (included on the next page), Participant Information Sheet and a hyperlink to the survey instrument.

Targeting Laypersons via Facebook:

> We make decisions and form opinions about facts, money and risk every day; but beliefs of all sorts can make similar situations very different. I am studying differences in how people find and use information, experience and knowledge that influence those decisions.
>
> Please take 15 minutes to contribute your views to my world-wide survey? It is anonymous, and asks you to select answers to simple multiple choice or rating type questions. There are no right or wrong answers.
>
> Also, please share this so we can build a global picture involving people in diverse industries and roles, and with diverse education, culture and experiences.
>
> Visit www.kerriodonnell.wordpress.com

Targeting Auditors and Fraud Investigators via Facebook and LinkedIn professional groups:

> **Please include your views in this international research**
>
> I would like to learn from members of this group about the effects of different experiences.
>
> I am an accounting lecturer at the University of Tasmania, Australia, currently researching differences between laypeople and professionals (in 40 countries so far!) in how they find and use information, experience and knowledge to form opinions.
>
> The views of accountants, auditors, fraud specialists and corporate executives are especially important to my research because the input of high-level information analysts is vital for a quality data set.
>
> Will you please contribute 15 minutes to my PhD by taking my online survey?
>
> This survey is anonymous, and takes approximately 15 minutes to complete.
>
> Please visit www.kerriodonnell.wordpress.com for an overview of the project, an Information Sheet with participant FAQs, ethical clearance details, contact information – and of course, the survey.

[school letterhead]

Subject: Research Invitation

I am undertaking my doctoral studies under the supervision of Associate Professor Trevor Wilmshurst and Dr William Maguire [retired] at the University of Tasmania, Australia. Your answers will help me develop a method to measure attitudes to information, past experience and knowledge that influence decision making. Attached is a Participant Information Sheet, which further explains the project.

The questionnaire asks simple questions about your views, and will take between 10 and 20 minutes to complete, depending on your answers.

The questionnaire is completely anonymous. No identifiable personal information will be collected, and participation presents no risks to you. Your consent to participate is implied by completion and submission of the survey.

Participation is voluntary, but as I need as many responses as possible to satisfy the requirements of my research, so your participation will be very much appreciated.

If you have any questions I can be contacted on (03) 6226 2755 or at Kerri.ODonnell@utas.edu.au. My supervisors can be contacted at Trevor.Wilmshurst@utas.edu.au or William.Maguire@utas.edu.au.

Click HERE [hyperlink] to start the survey.

This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, please contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au. Please quote ethics reference number H0013643.

Many thanks for your help,

Kerri O'Donnell
Doctoral Candidate

Kerri.ODonnell@utas.edu.au
University of Tasmania
School of Accounting & Corporate Governance
Private Bag 86
Hobart, Tasmania, 7109
AUSTRALIA

Appendix 4: Participant Information Sheet

You are invited to participate in a research study investigating inputs to, and processes of, decision making. This study is being conducted by Kerri O'Donnell in fulfilment of a PhD degree, under the supervision of Associate Professor Trevor Wilmshurst and Dr William Maguire [retired], at the University of Tasmania (Australia).

Chief Investigator:
Associate Professor Trevor Wilmshurst, University of Tasmania, School of Accounting & Corporate Governance, Locked Bag 1317, Launceston Tasmania 7250, Australia. Ph: +61 3 6324 3570. Email:
Trevor.Wilmshurst@utas.edu.au

Student Researcher:
Kerri O'Donnell, University of Tasmania, School of Accounting & Corporate Governance, Private Bag 86, Hobart Tasmania 7001, Australia. Ph: +61 3 6226 2755. Email: Kerri.ODonnell@utas.edu.au

What is the purpose of this study?
We are particularly interested in exploring any differences in how people in different occupation groups balance the mix of information, prior knowledge and experience they draw on as inputs for judgments and decision making.

Why have I been invited to participate?
You have been invited because your views are relevant to the research. The study is being conducted within the joint fields of Accounting and Corporate Governance, so groups of particular interest include those studying in either discipline, those employed in professional accounting or allied fields, and those involved in all types of businesses.

You are eligible to participate in this study if you are aged 18 or over. Participation in this study is entirely voluntary. There will be no consequences for those individuals who do not wish to participate.

What will I be asked to do?
You are asked to answer an online questionnaire, which should take you no longer than 10-12 minutes to complete.

You are asked to rate your personal views, so there are no correct or incorrect answers, just your views. (The questions are all multiple choice.)

Please answer the questions as honestly as possible, rather than choosing what you think the researchers might want you to.

Are there any possible benefits from participation in this study?

The information gathered from this study may assist researchers in further understanding the ways in which people use information, prior knowledge and experience to make decisions. Any significant differences that are identified between groups may help us to clarify expectations and improve communication between businesses and support organisations.

Are there any possible risks from participation in this study?

There are no foreseeable risks anticipated with participation in this study.

Participation is anonymous. As no personal identifying information will be collected, all answers will be treated confidentially.

What if I change my mind during or after the study?

You are free to withdraw from this study without providing an explanation if you do so before completing the questionnaire. All incomplete responses will be removed from the research data.

If you withdraw after completing the questionnaire, it will not be possible to remove your data from the study because responses are collected anonymously and are therefore unidentifiable.

What will happen to the information when this study is over?

The research data will be securely stored in electronic (spreadsheet) format for 5 years from the date of first publication, after which time the data will be destroyed.

How will the results of the study be published?

The results of this study will be published in a doctoral thesis in the first instance. It is also intended that the results will be submitted for publication in at least one academic journal, in the form of an article.

As the questionnaire is anonymous, you will not be identifiable in the publication of results.

If you wish to access a report of the results, you are welcome to join a mailing list by emailing Kerri.ODonnell@utas.edu.au, with the phrase "doctoral study results mailing list" in the subject line. The mailing list is open to interested people other than research participants, but in any case, your inclusion on the mailing list will not enable identification of any questionnaire responses as yours.

The publication process can take considerable time, but you will certainly be notified when the first publication is available.

What if I have questions about this study?
If you would like to discuss any aspect of this study, please contact Associate Professor Trevor Wilmshurst on +61 3 6324 3570. Also, please feel free to browse the School website to find out more about its research and about the people involved in this particular study.

"This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, please contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. Please quote ethics reference number H0013643."

Thank you for taking the time to consider this study. Please understand that by completing and submitting the anonymous survey, consent to participate in this study will be implied. This information sheet is yours to keep.

The questionnaire is now available HERE (hyperlink).

With thanks,

Kerri O'Donnell
Associate Lecturer & Doctoral Candidate
University of Tasmania
School of Accounting & Corporate Governance
Private Bag 86
Hobart, Tasmania, 7001
Australia

Appendix 5: Initial Long-form Survey Instrument

DEMOGRAPHICS

1. Are you female or male?
   - o Male
   - o Female

2. Which group includes your age?
   - o 17 or younger
   - o 18-20
   - o 21-25
   - o 26-35
   - o 36-45
   - o 46-55
   - o 56-65
   - o 66 or older

3. What education have you completed, or substantially completed?
   - o Did not complete high school
   - o High school certificate or equivalent (e.g., GED, year 12)
   - o Some college/university
   - o Trade qualification
   - o Bachelor degree
   - o Professional certification
   - o Graduate degree

4. Are you currently enrolled as a student?
   - o Yes, in a trade program / apprenticeship
   - o Yes, at a college/university
   - o Yes, in a professional program
   - o Yes, in graduate school
   - o Yes, in an informal program / other
   - o No, I am not currently enrolled as a student

5. Which of the following best describes your employment status?
   - o Employed, working 1-39 hours per week
   - o Employed, working 40 or more hours per week
   - o Not employed, looking for work
   - o Not employed, NOT looking for work
   - o Full-time unpaid work (carer, etc)
   - o Retired

6. Most of your training and/or experience is within which industry group?

7. Please indicate your main role(s).
- o Board member (not for profit)
- o Company director
- o CEO / CFO
- o Accountant or auditor
- o Law enforcement/Investigator
- o Small business owner / Self employed
- o Manager
- o Employee
- o Other (please specify)

7a. [CONDITIONAL] Your main directorship(s) have been in a(n):
- o Listed company
- o Unlisted public company
- o Private company

8. Have you also worked or trained as an accountant?
- o Yes
- o No

9. [CONDITIONAL] Your most senior accounting/audit role is:
- o Assistant
- o Graduate
- o Professionally qualified
- o Senior / Manager
- o Partner

10. [CONDITIONAL] Your main accounting role involves:

- o Corporate / Management accounting
- o Public accounting (including tax and business advisory)
- o Internal audit
- o External audit (financial)
- o Other (please specify)

11. In which country have you lived most?

- o Australia
- o China
- o United States of America
- o Other (please specify)

TRAITS

[This section is adapted from Wrightsman's (1991) Trust Scale. Respondents are required to select a point along a 5-point Likert scale for each of the fourteen items.]

Agree Strongly	Agree	Neither Agree nor Disagree	Disagree	Disagree Strongly

12. Please indicate the extent to which you agree or disagree with the following statements.

- Most students will tell the instructor when he has made a mistake in adding up their scores, even if he has given them more points than they deserve.
- If you give the average person a job to do, and leave them to do it, he will finish it successfully.
- People claim that they have ethical standards regarding honesty and morality, but few people stick to them when the chips are down.
- People usually tell the truth, even when they know that they would be better off lying.
- Nowadays people commit a lot of crimes and do bad deeds that go unnoticed.

- If most people could get into a movie without paying and be sure that they were not seen, they would do it.
- Most students do not cheat when taking an exam.
- Most people would tell a lie if they could gain by it.
- Most people are basically honest.
- If you act in good faith with people, almost all of them will reciprocate with fairness towards you.
- Most people lead clean, decent lives.
- If you want people to do a job right, you should explain things to them in great detail and supervise them closely.
- Most people are not really honest for a desirable reason; they're afraid of getting caught.
- Most people would cheat on their income tax if they had a chance.

SKILLS

[This section is adapted from Budner's (1962) Intolerance of Ambiguity instrument. Respondents are required to select a point along a 5-point Likert scale for each of the sixteen items.]

Agree Strongly	Agree	Neither Agree nor Disagree	Disagree	Disagree Strongly

13. Please indicate the extent to which you agree or disagree with the following statements.

- An expert who doesn't come up with a definite answer probably doesn't know much.
- I would like to live in a foreign country for a while.
- There is really no such thing as a problem that can't be solved.
- People who fit their lives to a schedule probably miss most of the joy of living.

- A good job is one where what is to be done and how it is to be done are always clear.
- It is more fun to tackle a complicated problem than to solve a simple one.
- In the long run it is possible to get more done by tackling small, simple problems rather than large and complicated ones.
- Often the most interesting and stimulating people are those who don't mind being different and original.
- What we are used to is always preferable to what is unfamiliar.
- People who insist upon a yes or no answer just don't know how complicated things really are.
- A person who leads an even, regular life in which few surprises or unexpected happenings arise really has a lot to be grateful for.
- Many of our most important decisions are based upon insufficient information.
- I like parties where I know most of the people more than situations where all or most of the people are complete strangers.
- Teachers and supervisors who hand out vague assignments give students a chance to show initiative and originality.
- The sooner we all acquire similar values and ideals the better.
- A good teacher is one who makes you wonder about your way of looking at things.

[The next section is adapted from the Kashdan et al (2009) Curiosity and Exploration Inventory-II instrument. Respondents are required to select a point along a 5-point Likert scale for each of the ten items.]

Agree Strongly	Agree	Neither Agree nor Disagree	Disagree	Disagree Strongly

14. Please rate the following ten statements for how accurately they reflect the way you generally feel and behave at this point in your life.

- I actively seek as much information as I can in new situations.
- I am the type of person who really enjoys the uncertainty of everyday life.
- I am at my best when doing something that is complex or challenging.
- Everywhere I go, I am out looking for new things or experiences.
- I view challenging situations as an opportunity to grow and learn.
- I like to do things that are a little frightening.
- I am always looking for experiences that challenge how I think about myself and the world.
- I prefer jobs that are excitingly unpredictable.
- I frequently seek out opportunities to challenge myself and grow as a person.
- I am the kind of person who embraces unfamiliar people, events and places.

Have you ever undertaken training about any aspect of fraud?

- o No
- o Yes, informal
- o Yes, formal (part of a qualification)
- o Yes, formal (specialist qualification)

Survey Terminology Disclosure Statement

As explained in the Invitation and Information Sheet, the purpose of the research is to measure how people use information, experience and knowledge to make decisions. Given that, it is very important that the research terminology does not lead participants toward answer choices that don't genuinely reflect their views.

One term, used throughout the research project, has been omitted from the questionnaire and preliminary information. The term 'scepticism' represents how a particular balance of experience and knowledge are used to gather and assess

information, which is what I hope to observe in the mix of responses. That is – I am hoping to collect a range of definitions as determined by the collective responses. The purpose of omission is to elicit more authentic responses. It would be counterproductive for me to provide definitions or alternate terminology because I'm trying to elicit a very wide variety of participants' views of the issues from the ground up rather than top-down.

The term "professional scepticism" is known to auditors, defined according to Auditing Standard ASA102 as "an attitude that includes a questioning mind, being alert to conditions which may indicate possible misstatement due to error fraud, and a critical assessment of audit evidence". The audit definition is highlighted in both undergraduate and professional education, is emphasised in the Auditing Standards, professional papers and regulatory recommendations, and is also prominent in legal cases against auditors. Therefore use of the term would likely influence accountant/auditor respondents to select what they perceive to be a 'most correct' answer rather than that which most reflects their true perspective. This would unduly bias the research data.

The term is not understood in the same way by those outside the audit and related fields. However, this is equally as problematic as the problem above, because colloquial usage is usually to mean 'disbelief', 'doubt' or 'cynicism'. Such misinterpretation of the research purpose and questions would influence respondents in to answer in ways that are not intended by the research.

This research is interested in both these, and other, definitions of scepticism, as revealed in the responses of participants in this survey. It is about your methods of evaluation and decision making, and the particular balance of information, experience and knowledge that you use to make decisions.

If, after reading this disclosure statement, you wish to withdraw your data from the study, please close your browser without clicking the 'submit' link.

Thank you for your participation.

Appendix 6: Per-Group Scale Item Descriptives

Group 1 (QFI) Questionnaire Responses

Qn #	Theoretical Score Range		Actual Range		Mean	Mode	Standard Deviation
1	-2 : +2	5	**-1 : +1**	**3**	1	1	0.54
2 (R)	-2 : +2	5	-2 : +2	5	0	-1	1.10
3	-2 : +2	5	-2 : +2	5	0	1	0.89
4 (R)	-2 : +2	5	**-2 : +1**	**4**	0	1	1.07
5	-2 : +2	5	**-1 : +2**	**4**	1	1	0.87
6 (R)	-2 : +2	5	-2 : +2	5	0	-1	1.00
7	-2 : +2	5	**-1 : +2**	**4**	1	1	0.73
8	-2 : +2	5	-2 : +2	5	1	1	0.87
9	-2 : +2	5	**0 : +2**	**3**	1	1	**0.42**
10 (R)	-2 : +2	5	-2 : +2	5	0	1	1.06
11	0 : 4	5	0 : 4	5	2	1	1.09
12	0 : 4	5	0 : 4	5	2	1	1.13
13 (R)	-2 : +2	5	-2 : +2	5	0	1	1.09
14 (R)	-2 : +2	5	-2 : +2	5	0	0	0.91
15 (R)	-2 : +2	5	-2 : +2	5	0	-1	1.09
16	0 : 4	5	0 : 4	5	3	3	**1.18**
17	0 : 4	5	0 : 4	5	2	3	1.12

From this table, we observe that the range of responses to questions 1, 4, 5, 7 and 9 was narrower than the aggregated results.

Group 2 (Auditor) Questionnaire Responses

Qn #	Theoretical Score Range		Actual Range		Mean	Mode	Standard Deviation
1	-2 : +2	5	-2 : +2	5	0	1	0.87
2 (R)	-2 : +2	5	-2 : +2	5	-1	-1	1.13
3	-2 : +2	5	**-2 : +1**	**4**	0	0	0.97
4 (R)	-2 : +2	5	-2 : +2	5	0	-1	1.03
5	-2 : +2	5	-2 : +2	5	0	1	0.92
6 (R)	-2 : +2	5	**-2 : +1**	**4**	0	-1	0.92
7	-2 : +2	5	-2 : +2	5	0	1	1.04
8	-2 : +2	5	-2 : +2	5	1	1	**0.8**
9	-2 : +2	5	-2 : +2	5	1	1	0.94
10 (R)	-2 : +2	5	**-2 : +1**	**4**	0	-1	1.03
11	0 : 4	5	0 : 4	5	2	1	1.04
12	0 : 4	5	0 : 4	5	1	1	1.04
13 (R)	-2 : +2	5	-2 : +2	5	0	0	1.11
14 (R)	-2 : +2	5	-2 : +2	5	0	0	**1.15**
15 (R)	-2 : +2	5	-2 : +2	5	-1	-1	1.1
16	0 : 4	5	0 : 4	5	2	3	1.08
17	0 : 4	5	0 : 4	5	2	2	1.11

From this table, we observe that the range of responses to questions 3, 6 and 10 was narrower than the aggregated results. This increase in consistency is across questions which are different to the questions which were answered more consistently by QFIs.

Group 3 (SL) Questionnaire Responses

Qn #	Theoretical Score Range		Actual Range		Mean	Mode	Standard Deviation
1	-2 : +2	5	**-1 : +1**	**3**	0	0	0.71
2 (R)	-2 : +2	5	**-1 : +1**	**3**	0	-1	0.99
3	-2 : +2	5	**-1 : +1**	**3**	-1	-1	0.83
4 (R)	-2 : +2	5	**-2 : +1**	**4**	0	1	0.82
5	-2 : +2	5	**-1 : +1**	**3**	0	-1	0.95
6 (R)	-2 : +2	5	**-2 : +1**	**4**	-1	1	**1.42**
7	-2 : +2	5	**-1 : +2**	**4**	1	1	**0.41**
8	-2 : +2	5	**-1 : +2**	**4**	1	1	0.87
9	-2 : +2	5	**-1 : +2**	**4**	0	0	0.74
10 (R)	-2 : +2	5	**-1 : +1**	**3**	0	-1	0.98
11	0 : 4	5	**1 : 3**	**3**	2	1	0.84
12	0 : 4	5	**0 : 3**	**4**	2	1	0.98
13 (R)	-2 : +2	5	-2 : +2	5	-1	-2	1.35
14 (R)	-2 : +2	5	**-2 : +1**	**4**	0	1	1.04
15 (R)	-2 : +2	5	**-2 : +1**	**4**	-1	-2	1.16
16	0 : 4	5	**1 : 3**	**3**	2	2	0.54
17	0 : 4	5	**1 : 4**	**4**	2	1	1.05

From this table, we observe that the range of responses to all questions, with the exception only of question 13, was narrower than the aggregated results. The most consistently answered item was question 7, which differs to the aggregated results as well as the QFI and Auditor results.

Group 4 (NSL) Questionnaire Responses

Qn #	Theoretical Score Range		Actual Range		Mean	Mode	Standard Deviation
1	-2 : +2	5	**-1 : +2**	**4**	1	2	1.01
2 (R)	-2 : +2	5	-2 : +2	5	1	2	**1.44**
3	-2 : +2	5	-2 : +2	5	1	2	1.35
4 (R)	-2 : +2	5	-2 : +2	5	1	2	1.39
5	-2 : +2	5	**-1 : +2**	**4**	1	2	**0.60**
6 (R)	-2 : +2	5	-2 : +2	5	0	1	1.34
7	-2 : +2	5	-2 : +2	5	1	2	0.96
8	-2 : +2	5	-2 : +2	5	1	2	1.02
9	-2 : +2	5	-2 : +2	5	1	2	0.99
10 (R)	-2 : +2	5	**-1 : +2**	**4**	1	2	1.04
11	0 : 4	5	0 : 4	5	2	3	0.87
12	0 : 4	5	0 : 4	5	3	4	1.18
13 (R)	-2 : +2	5	**-2 : +1**	**4**	0	0	0.70
14 (R)	-2 : +2	5	-2 : +2	5	0	0	0.68
15 (R)	-2 : +2	5	**-2 : +1**	**4**	-1	-1	**0.60**
16	0 : 4	5	0 : 4	5	2	2	0.67
17	0 : 4	5	0 : 4	5	2	1	0.84

From this table, we observe that the range of responses to questions 1, 5, 10, 13 and 15 was slightly narrower than the aggregated results. Questions 1 and 5 were also answered more consistently by QFIs and SLs than is indicated for the Auditor group and the aggregated results as a whole, and question 10 reflects similarity with the Auditor and SL results. However, the smaller range of responses to questions 13 and 15 is unique to the NSL group.

Appendix 7: Auditor Sub-scale Correlations

Auditors in the Subjective Range			SCEPT	TRAIT	SKILL	BIAS
Kendall's tau_b	SCEPT	Correlation Coefficient	1.000	.816	-.816	-1.000
		Sig. (2-tailed)	.	.221	.221	.
		N	3	3	3	3
	TRAIT	Correlation Coefficient	.816	1.000	-1.000	-.816
		Sig. (2-tailed)	.221	.	.	.221
		N	3	3	3	3
	SKILL	Correlation Coefficient	-.816	-1.000**	1.000	.816
		Sig. (2-tailed)	.221	.	.	.221
		N	3	3	3	3
	BIAS	Correlation Coefficient	-1.000**	-.816	.816	1.000
		Sig. (2-tailed)	.	.221	.221	.
		N	3	3	3	3

**. Correlation is significant at the 0.01 level (2-tailed).

Auditors in the Sceptical Range			SCEPT	TRAIT	SKILL	BIAS
Kendall's tau_b	SCEPT	Correlation Coefficient	1.000	.677**	.229	-.598**
		Sig. (2-tailed)	.	.000	.207	.001
		N	19	19	19	19
	TRAIT	Correlation Coefficient	.677**	1.000	-.184	-.416*
		Sig. (2-tailed)	.000	.	.312	.019
		N	19	19	19	19
	SKILL	Correlation Coefficient	.229	-.184	1.000	-.297
		Sig. (2-tailed)	.207	.312	.	.098
		N	19	19	19	19
	BIAS	Correlation Coefficient	-.598**	-.416*	-.297	1.000
		Sig. (2-tailed)	.001	.019	.098	.
		N	19	19	19	19

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Auditors in the Professional Scepticism Range			SCEPT	TRAIT	SKILL	BIAS
Kendall's tau_b	SCEPT	Correlation Coefficient	1.000	.243	.208	-.114
		Sig. (2-tailed)	.	.140	.214	.480
		N	23	23	23	23
	TRAIT	Correlation Coefficient	.243	1.000	-.354*	.232
		Sig. (2-tailed)	.140	.	.033	.146
		N	23	23	23	23
	SKILL	Correlation Coefficient	.208	-.354*	1.000	-.119
		Sig. (2-tailed)	.214	.033	.	.463
		N	23	23	23	23
	BIAS	Correlation Coefficient	-.114	.232	-.119	1.000
		Sig. (2-tailed)	.480	.146	.463	.
		N	23	23	23	23

*. Correlation is significant at the 0.05 level (2-tailed).